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TRANSPORTATION

No. 104

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MOTOR VEHICLE

TECHNOLOGICAL ADVANCES IN MOTOR VEHICLE PRODUCTION

Moscow AVTOMOBIL'NAYA PROMYSHLENNOST' in Russian No 9, Sep 82 pp 4-6

[Article by A. A. Nevelev, candidate of economic sciences, RSFSR Gosplan: "Scientific-Technical Progress and Its Role in the Intensification of Motor Vehicle Production"]

[Text] The "Basic Directions for the Economic and Social Development of the USSR Over the Period of 1981-1985 and up to the Year 1990," adopted by the 26th CPSU Congress, point out that in the 11th Five-Year Plan the development of science and technology must be subordinated to a still greater degree to solving Soviet society's economic and social problems, to speeding up conversion of the economy to intensive development and to raising the efficiency of social production, and that in all sectors of the economy the line needs to be consistently followed toward more rapid retooling of production and toward the creation and manufacturing of machines and equipment that make it possible to improve working conditions and raise labor productivity.

A most important means of solving these problems is the constant acceleration of scientific-technical progress, which in the context of advanced socialism is a process that unifies the conduct of scientific research and development and application of improved equipment and technology, highly efficient new materials, sources of energy and methods of managing production which make it possible to ensure a steady growth of the output of needed products, improvement of product quality in every way, and optimum utilization of all forms of production resources in order to intensify production and raise production efficiency.

The motor vehicle industry has been given a very important role in solving the tasks set by the 26th CPSU Congress. This is understandable: the sector has always set the tone in mastering new equipment and technology, in automating and mechanizing the principal and auxiliary processes, and in improving the management and organization of production, and on the basis of those efforts it has attained notable results in the intensification of production. For instance, a rather large experience has been gained in motor vehicle building in the creation of new trucks and automobiles, buses, trailers, internal-combustion lift trucks and other motor vehicles; standard automatic production lines, sections and even shops for machining parts of the same kind: multioperation lines have been set up and are in operation for the production of many parts

of ZIL, GAZ, VAZ and KamAZ vehicles, and also lines for manufacturing universal-joint, railroad and other types of roller and ball bearings, etc. For example, at ZIL [Moscow Motor Vehicle Plant imeni I. A. Likhachev] alone at the beginning of the 11th Five-Year Plan there were in operation 66 fully mechanized shops and sections, more than 320 automatic production lines and more than 700 mechanized flow lines. The Volga Motor Vehicle Plant imeni 50-Letije SSSR [VAZ], in which more than 350 automatic production lines are in operation, including 117 in machine shop production, 50 in forge and press shop production, 35 in welding, 9 in foundry production, 39 in assembly, and a large number of automated units and conveyors. It has a reliable and up-to-date system for computerized management of production. At KamAZ [Kama Motor Vehicle Plant] there are about 500 automatic production lines in operation, including 350 in machine shops.

Interesting experience in the extensive introduction of the advances of scientific-technical progress, in raising production efficiency and in improving the quality of all products has also been gained at GPZ-1 [No 1 State Bearing Plant], which recently celebrated its first half century, as well as at many other enterprises in the sector. They have typically made the transition from automation and mechanization of individual operations to introduction of complexes of automatic machine tools and production lines embracing an entire technological cycle. It is sufficient to say that at the present time the sector already has 135 fully mechanized shops. Moreover, the growth rates of the stock of automated equipment is becoming more and more notable: for example, the overall growth of the stock of machine tools was 15 percent during the 10th Five-Year Plan, while the number of automatic production lines increased 40 percent. To be specific, in foundry production 36 automatic production lines and about 450 automatic and semiautomatic machines were introduced; in machine shop production 815 automatic production lines and more than 20,000 specialized machine tools and automatic and semiautomatic machines; in welding 90 automatic welding and assembly lines, 100 units for new welding methods, and 40 machines for friction welding; in paint shop production about 60 units for progressive painting methods (electrodeposition, automatic air spraying, and so on); in preparatory and forging production steam stamping hammers and horizontal forging machines of outdated design were replaced by highly productive automatic equipment and specialized automatic production lines for manufacturing such parts as crankshafts, connecting rods, etc. Equipment for mechanization has also been extensively introduced in the movement of materials and warehouse operations--conventional and overhead conveyors, nonrail transport, and standardized containers. The length of conveyors, for example, is now more than 1 meter per worker, and at VAZ and KamAZ it is more than 3.5 meters per worker.

A high pace of introduction has been maintained not only by progressive manufacturing equipment, but also by progressive manufacturing processes, including low-waste technology. For instance, whereas the volume of output of motor vehicles in the years of the 10th Five-Year Plan was 44 percent, the output of hot stampings manufactured on progressive equipment increased 70 percent. At the same time the production of gears, sprockets, splined shafts and other parts by hot and cold rolling increased more than twofold, and the output of parts by the methods of cold stamping increased nearly threefold.

Scientific-technical progress and the process of intensification have been taking place in the motor vehicle industry by virtue of a rise in the technical level of production, a change in designs and technical characteristics of motor vehicles and engines, introduction of progressive technology and computerized management systems, higher product quality, and the use of economical new raw materials and supplies.

The present stage of economic development is typified by several basic directions in the intensification of production: use of the advances of scientific-technical progress for technical reconstruction of existing shops (ZIL, GAZ, AZLK [Moscow Motor Vehicle Plant imeni Leninskiy Komsomol], GPZ-1, Minsk Motor Vehicle Plant, and other enterprises); construction of new plants (KamAZ, new branches of ZIL, etc.), whose operation is based on the principles of more thorough specialization and cooperation and the mechanization and automation of production; exerting an impact on the product mix by withdrawing outdated models from production and putting more efficient ones into production which are distinguished by high technical and operating characteristics and designs created so as to take into account present-day requirements as to use of standard components and assemblies and manufacturability. Efforts in all these directions during the 11th Five-Year Plan are continuing at a fast pace. New and improved prototypes of motor vehicles are being created,* many enterprises, shops and sections are being retooled, technology is improving, capacities for the production of tools, especially large dies, and the manufacture of machine tools within the sector are developing, the repair and maintenance of equipment is improving, and economical types of raw materials and supplies are being introduced.

For instance, particular attention in the technology of motor vehicle manufacturing is being concentrated on raising the level and efficiency of preparatory production operations (which determine to a considerable degree all subsequent technological phases) and also production operations involving difficult working conditions. For example, in foundry production there will be almost a twofold increase in the output of castings from ferrous metals on shaping lines (thanks to intensification of the operation of existing automatic production lines and introduction of new ones), and 220 pieces of equipment for cleaning castings and 290 automatic and semiautomatic core-making machines are being introduced. In forge shops hot forging lines will be used ever more extensively; there will be a 40-percent increase in the volume of production of forgings using progressive processes and equipment, including a 500,000-ton increase in the output of forgings with increased accuracy produced on presses, a 20,000-ton increase on automatic machines, and an increase of nearly 40,000 tons on cross-wedge rolling mills. Production by the method of cold pressing of parts will develop further and increase nearly twofold, and the manufacturing of parts from powders will more than double. The extent of use of coiled sheet in sheet-stamping production will increase by the same proportion. In these operations more than 2,500 presses will be equipped with automatic devices.

* Titkov, A. I., "Motor Vehicles in the 11th Five-Year Plan," AVTOMOBIL'NAYA PROMYSHLENNOST', No 8, 1982, pp 1-4.

In order to raise labor productivity and reduce the number of job slots in machine shop production the course will also be continued toward automation, including the introduction of more than 700 new automatic production lines, combination machine tools and machine tools with numeric program control manufactured in the machine tool building sector and at enterprises of the Ministry of Automotive Industry, and so on. A program has been outlined for modernizing 5,000 metal-cutting, general-purpose machine tools and for introducing a large number (a threefold increase over the 10th Five-Year Plan) of robots and manipulators and machine tools with programmed control (a 3-4-fold increase), as well as progressive welding equipment (more than 100 automatic and mechanized production lines, more than 500 units of equipment for friction welding and resistance welding instead of arc welding, as well as laser, electron beam and plasma welding). Ion-plasma units will improve the quality and life of the products produced at no fewer than 50 sections for metal depositing and spraying wear-resistant coatings on motor vehicle parts, and also new materials (tsinkrometall, galvanized sheet) and manufacturing processes for applying protective and decorative coatings (powder paints, preventive compositions of the "tektit" type, alkaline electrolytes, etc.). To improve ecological indicators projects will be carried out to equip painting chambers with devices for complete combustion of solvent fumes, to provide effective cleaning units for galvanization, etc.

Thus the principal feature in development of production in the 11th Five-Year Plan will be a sharp increase in the stock of automatic production lines and automatic complexes in all stages of production. The relative share of automatic and semiautomatic machine tools in the stock of equipment in the principal production operation of the sector will be more than 60 percent, and it will reach 80-90 percent at KamAZ, VAZ, ZIL and certain other plants.

The large contribution to raising the technical level of motor vehicle production will be made by specialists of scientific research, project planning and design and process engineering organizations (NAMI [Central Scientific Research Institute of Motor Vehicles and Motor Vehicle Engines], NIITavtoprom [Scientific Research Institute of the Technology of the Automotive Industry], Giproavtoprom [State Institute for the Planning of Automotive Industry Plants], VNIIPP [All-Union Scientific Research, Design and Production Engineering Institute of the Bearing Industry], etc.) and the staff engineering services of the leading plants (ZIL, VAZ, GAZ, KamAZ, etc.), which have large experimental shops and research laboratories. The creative collaboration of scientific organizations with the plants is becoming one of the typical features of scientific-technical progress in the 11th Five-Year Plan. This can be illustrated by ZIL, whose work force intends to apply at least 46 joint scientific research developments thanks to further development and strengthening of relations with scientific research organizations, making it possible to accomplish a program of interrelated measures to mechanize and automate labor and to raise the level of mechanization to 84.6 percent in the principal production operation, 93.5 percent in materials-handling and warehouse operations, and to 96.1 percent in welding work.

Plans at the plants of this production association call for creating and applying new prototypes of automatic combinations of equipment manufactured in

the Soviet Union for machining metal by pressure and fundamentally new assembly processes using automated production lines. Provision has been made for extensive introduction of low-waste technology, which will make it possible to save at least 120,000 tons of rolled products annually.

The facts given above show that the most serious attention is being paid to scientific-technical progress in the sector, attention being paid, moreover, to all its components and above all, as indicated above, to the creation of new motor vehicles which meet present-day requirements. Calculations show that by this means alone the national economy will save many millions of rubles, since the sectors using this equipment will reduce their unit costs of moving freight because of higher carrying capacity of motor vehicles, their higher reliability (and consequently lower costs of maintenance and repair), improved fuel economy, and so on. Thanks to the larger capacity of engines and expanded output of trailers considerably fewer drivers will be needed. All of this is becoming possible because of successful realization of the most important components of scientific-technical progress, especially improvement of technology guaranteeing a rise in the intensification of production.

"Intensification of the economy and a rise in its efficiency," Comrade L. I. Brezhnev noted at the 26th party congress, "if we break down that formula into the language of practical matters, consists above all of augmenting the results of production faster than production costs so that more can be achieved though comparatively smaller resources are being fed into production." Consequently, development of motor vehicle production and fulfillment of the plan for the 11th 5-year period should in large part be achieved through broad use of the most up-to-date advances of scientific-technical progress, improvement of organization and management, improvement of the qualifications of personnel, development of their initiative, raising labor productivity, and conservation of physical resources in every way. Science must in its development set the pace for production. Intensification means use of the most refined manufacturing processes, which are efficient and economical from the standpoint of inputs of both labor and also materials, energy and other resources. A central place is taken here by waste-free and low-waste technologies, improved utilization of raw materials, supplies and fuel, reduced consumption of rolled ferrous metals in the vehicle and the engine, replacement of nonferrous metals by cheaper materials, reduction of fuel consumption rates, and extensive use of synthetic materials.

The course aimed at increasing the efficiency of production and at the intensification of production is imposing certain requirements as to the forms and directions of scientific-technical progress. These are above all a strengthening of the labor-saving orientation of scientific-technical progress, which guarantees that labor productivity rises faster than the growth of output. Only if this condition is met will it be possible to overcome the growing limitation on labor resources. In the automotive industry, then, equipment will be created at a faster pace that will serve the purpose of mechanizing manual labor, above all unskilled and heavy labor, and the transition will be made from mechanizing the principal processes to overall mechanization and automation of production and to the creation of automated systems.

The labor-saving directions of scientific-technical progress in the context of the intensification of production are supplemented by the capital-saving directions. That is why in the current 5-year period the task has been set of creating and introducing equipment and processes which will not only raise labor productivity, but also increase the rate of output per unit of fixed capital.

Successful development of scientific-technical progress is not possible without raising the organizational and technical level of auxiliary production; that is why scientifically sound systems are being introduced at the sector's enterprises embracing the complex of economic, technical and organizational decisions concerning tooling support, loading and unloading operations, movement of materials and warehouse operations, warehouse management, the repair of production equipment and introduction of computerized management systems, which will guarantee higher efficiency in tool production and shorter time and lower outlays in preparing new vehicles for production.

The course adopted by the party toward intensification of the economy is channelling in a single stream all the directions of technical policy and strengthening the purposive and planned character of scientific-technical progress, thereby ensuring not only consistency between the socioeconomic and scientific-technical aspects of the sector's development, with the decisive role played by the former, but it also necessitates higher forms and methods of management of scientific-technical progress suitable to advanced socialism. And this in turn entails organizational changes in management, and improvement of management. In the motor vehicle industry there has been quite a bit experience in this kind of improvement (VAZ, ZIL, ATE-1 [No 1 Moscow Motor Vehicle and Tractor Electrical Equipment Plant], KamAZ, etc.). But the large new tasks of increasing production efficiency require the fastest improvement of management and of the entire system of economic performance not only in the leading production and all-union industrial associations, but indeed at all enterprises in the sector, because improved management of every association, plant and shop is the key to the fastest performance of the tasks set by the 26th CPSU Congress: to reduce the need for means of production per unit of the end product solely through optimization of management and improved utilization of existing capacity and to fulfill the plan with a smaller labor force. This is evidenced by the historic experience and--not least--by the results of socialist competition for a worthy celebration of the 60th Anniversary of the USSR.

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MOTOR VEHICLE

BOG BUGGY UNDERGOES TESTS

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 20 Oct 82 p 1

[Article by S. Sadoshenko, Krasnoyarsk]

[Text] The staff of the Krasnoyarsk Tire Plant has fulfilled one of the main points of socialist obligations for worthy celebration of the 60th Anniversary of the USSR; it has manufactured the first tires for the bog buggy "Tyumen."

This innovation immediately mastered the plant tests. In the physical-mechanical laboratory they cut the tire to pieces, they studied its structure, and they analyzed its composition. In another laboratory they put it on a running test machine, and now it is turning day and night without stopping, covering thousands of kilometers on a "road" with quite a few potholes.

Unsparing in their treatment of the innovation, the testing people are intentionally thinking up more difficult operating conditions for it. After all, the bog buggies have to work at Tyumen, in the harsh climate of the North. And that means that the tires must travel equally well in the mud, in the tundra and taiga, and over the snow, must withstand temperature fluctuations from -40 to +40° C.

"This model, developed by the Dnepropetrovsk Scientific Research Institute of the Tire Industry, looks unusual among its 'sisters,'" says V. Byl'tsova, chief of the plant tire planning and design department. "It is heavier than the tires for the MAZ [Minsk Moto.: Vehicle Plant] and KrAZ [Kremenchug Motor Vehicle Plant] trucks, its tread has no configuration on it whatsoever. We have been accustomed to manufacturing tires for various motor vehicles and agricultural equipment, but this resembles more the tire for a roller."

Workers on the shift of senior foreman A. Dmitriyev, who were assigned the job of building the first lot of tires for the bog buggy, immediately noted that the process of manufacturing it is somewhat simpler than the process of manufacturing conventional tires. The main thing is that no fundamentally new equipment at all is required for organizing series production: it will be manufactured on the same production lines as tires for conventional vehicles.

This year the people of Krasnoyarsk are manufacturing 300 tires for the bog buggy "Tyumen," and next year the output will already be 3,000. Specialists

of the Ukrainian Institute and the Siberian people will be following closely how the innovation behaves under regular operating conditions.

The Krasnoyarsk tiremakers are also successfully filling other orders as well. To be specific, orders on behalf of the Food Program. This year they manufactured the first lot of tires for the KTU-10 fodder loader. The tires for the GAZ-63 trucks, which operate mainly in rural localities, were altered. The tire is now a kilogram lighter, but the service life has remained the same. The transition to series production of this model will make it possible to save about 480 tons of rubber compounds a year; they can be used to manufacture an additional 12,000 tires.

Tires for the bog buggy "Tyumen" are the fifth new model which the Krasnoyarsk people have undertaken to manufacture in the current 5-year period.

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MOTOR VEHICLE

MISUSE OF FARM VEHICLES DISCOVERED

Moscow SOVETSKAYA ROSSIYA in Russian 12 Oct 82 p 2

[Article by N. Karnovich and L. Prokof'yev, Moscow: "Where Are You Hurrying to?"]

[Text] In September 1979 correspondents of SOVETSKAYA ROSSIYA and personnel of Gosavtoinspeksiya [State Motor Vehicle Inspectorate] made an inspection tour on the use of trucks of the agricultural sector during the period of the harvest campaign. In official responses which the editors received at that time it was said that the shortcomings noted in the article entitled "On the Edge of the Road" would be corrected.

Three years have passed. We again traveled in the patrol car on the crowded main roads of the capital with Senior Police Lieutenant V. I. Muskat'en'yev, inspector of the 10th Squad of the Moscow GAI [State Motor Vehicle Inspectorate]. One of the first encounters was on the ring road around Moscow. Having seen the sights, the ZIL-130 stake-body truck belonging to the "Drushba" Kolkhoz in Bryansk Oblast was hurrying home.

"We traveled to Ryazan for spare parts," the driver G. Vorob'yev explained. "We sat there for 2 days. But in vain...."

But can it be that the managers of the farm did not think in advance about an elementary thing: to agree on the spare parts by telephone or simply to send someone, but not to assign a 5-ton ZIL to drive there in vain and to burn up gasoline when it is needed in the harvest?

I. Rudnichenko, a driver for Selkhoztekhnika in Belgorod Oblast, and the engineer V. Kustov also drove to Moscow for spare parts. They drove about the capital for 3 days trying to fill out the necessary documents.

"Is it possible that a truck is used so inefficiently during this feverish time?" we asked with curiosity. "After all, at this time every truck ought to be accounted for."

"Oh, no," Rudnichenko assured us. "We have plenty of Leningrad and indeed other trucks. They will manage...."

How much indifference and cynicism there is in these words, how much parasitism and departmental egoism!

On the Sad Ring Road a GAZ-52 truck was moving uncertainly in the flow of traffic. We stopped it. The truck belonged to the "Lugovoy" Sovkhoz in Aksayskiy Rayon in Rostov Oblast. In the back there was 1.5 tons of vegetables and fruit: tomatoes, Bulgarian peppers, eggplant, onions, apples and plums.

"We are going to Rossemovoshch at 96 Berzarin Street on instructions from the sovkhoz director N. F. Maslennikov," explained B. Korochentsev, head of the garage, and V. Rakhmatullin, engineer, interrupting one another. "And you see we do not know the way."

"Who are you delivering the goods to? After all, Rossemovoshch is an institution, but not a depot."

"We do not know," the new arrivals stuttered in response. But, recovering from their confusion, they cleared it up: "They will tell us there what to do."

In spite of the suspicious bill of lading and the unconvincing explanations, we still decide to escort the errant truck. But it soon turns out that there is no such organization in Berzarin Street and never was. In actuality it is located near Dzerzhinskiy Square. But this was discovered in the OBKhSS [Department for Combating the Embezzlement of Socialist Property and Speculation], where the trip of the "bandits from Rostov" was interrupted.

... The next encounter, equally unexpected, occurred on the Warsaw Highway. A truck from the "Butikovo" Sovkhoz in Zaokskiy Rayon in Tula Oblast. The truck was carrying pipe. It had no documents for them. According to A. Lotarev, the driver, they had been loaded "yesterday, about 2200 hours." He did not know who loaded it, or where, he did not know his way about Moscow.

The trip in this truck also ended in the OBKhSS....

As a rule in the period of the harvest campaign there is an increased need in rural areas not only for trucks, but also for buses needed to rapidly deliver people to the place where they will work. But apparently that is not the way they figure on the "Rassvet" Kolkhoz in Venevskiy Rayon of Tula Oblast. How else is one to explain the fact that the PAZ-657 bus of that farm was traveling on the boulevards of the capital, working for the "Khimfoto" Factory?

"I live in Moscow, and I only receive my pay in the gasoline from the kolkhoz," said the driver I. Smirnov.

... As we see, over the past 3 years little has changed in the practice of the way farm vehicles are used. Yet in the feverish time in the fall not a single vehicle should leave the rayon without the knowledge and permission of the rayon headquarters for conducting the harvest.

Still another important problem. As we know, in building up the motor pool for the harvest in the kray, oblast or rayon they start first with their own transportation capabilities—rural, urban, and industrial. But what in actuality is the result?

We encountered, for example, a ZIL-555 dump truck belonging to the trust Spetsset'stroy of USSR Minenergo [Ministry of Power and Electrification], registered in the city of Balabanovo in Kaluga Oblast. R. Goneyev, a Muscovite, was at the wheel.

"This is the second year I have been working with it," he said. "But in all we have 12 trucks from Kaluga Oblast."

Yet another ZIL-555 dump truck from the same oblast is working permanently at the "Manometar" Plant. In Moscow and neighboring rayons of the oblast various organizations maintain a great number of vehicles which are registered in Kaluga, Tula, Bryansk, Yaroslavl and other oblasts. This is a strange practice of trucking companies from the periphery acting as "patrons" for the capital.

... These meetings on the roads are evidence of surprising mismanagement and indifference. Today when the slogan of the harvest campaign is "Haul and Preserve the Harvest Without Losses," the managers of kolkhozes and sovkhozes should not forget this: the main task of agricultural transport is to work for the harvest.

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MOTOR VEHICLE

BRIEFS

GAZ-430 TRUCK--The Gorkiy motor vehicle builders have manufactured the series of new model trucks precisely on schedule. The GAZ-430 truck, which can carry 4.5 tons and is intended for agriculture, is capable of pulling trailers. The design of a number of the truck's most important assemblies has been improved. It was designed to operate in combination with harvesting equipment and has high roadability. [Text] [Moscow TRUD in Russian 10 Aug 82 p 1] 7045

KUTAISI DIESEL ENGINES--Production of diesel engines began yesterday at the Kutaisi Motor Vehicle Plant imeni Ordzhonikidze. This ended the most important stage of preparations for assembly-line production of new truck-and-trailer combinations with a carrying capacity of 11 tons for use in agriculture. The Kutaisi designers and workers were helped in building the diesel engine by motorbuilders of Yaroslavl and Naberezhnyye Chelny. [Text] [Moscow TRUD in Russian 23 Sep 82 p 1] 7045

CSO: 1829/29

RAILROAD

IMPROVEMENTS MADE IN RAILROAD TRANSPORT

Transporting Ekibastuz Coal

Moscow ZHELEZNODOROZHNYY TRANSPORT in Russian No 5, 1982 pp 2-7

[Article by N. P. Ovsyanik, chief of the Tselinna Railroad and S. P. Kurzhey, general director of the coal production association, Ekibastuzugol]

[Text] "Cooperation with the Related Workers of Ekibastuz--Experience and Problems"--In accordance with the decisions of the 26th CPSU Congress, the Pavlodar-Ekibastuz territorial production complex is intensifying the extraction of coal and the production of alumina. It is also doing work on the construction of large GRES installations and it is building new industrial enterprises and renovating the existing ones. The maintenance of shipments of freight for the country's new fuel and energy base and the organization of rhythmic transport of coal and other products--these constitute the most important tasks of the collectives of the Pavodar branch and the Tselinna Railroad as a whole. Right now coal comprises about 50 percent of the shipments carried out on the railroad.

Efficient organization of the operational activity of the mainline in many respects determines the uninterruptedness of the transport of fuel to the large area which embraces the regions of North Kazakhstan, the Urals and Western Siberia, the locations of the coal carrying lines of the Tselinna and the neighboring railroads which connect the coal pits of Ekibastuz with the high-powered thermal electric power stations. To handle the increasing volume of shipments of fuel we are stepping up the technical potential of the stations and sectors for the travel of empty and loaded express trains. The Ekibastuz coal operation is being improved and measures are being taken to enhance the organization of the work of the collectives of coal, electric power and railroad workers.

At first, because of lack of the proper cooperation between the railroad workers and the workers of the association, major difficulties arose, the shipment of fuel was not provided for on schedule, there were considerable layover of cars and delay of the loading mechanisms waiting for delivery and for the harvest; not fulfilled also were the schedules for the delivery of empty rolling stock for loading. To eliminate these deficiencies we introduced a single technology for the work of the stations handling Ekibastuz coal and the

loading and transport administration of the association. We also clearly defined the procedure for fulfillment of the receiving and delivery and freight operations and we systematically strengthened the technical base for the co-operating enterprises.

The associated organizations took on joint socialist commitments which provide for mutual responsibility and measures to be carried out by the railroad, coal and electric power workers of Ekibastuz with respect to the maintenance of efficient coordinated operation of the transport conveyer and rhythmic delivery of fuel to the electric power stations.

Simultaneously with the construction of "Bogatyr," the world's largest coal pit, we put in operation station Ekibastuz II, a yard for cleaning, a point for current repair of open cars without uncoupling, a car repair depot, the station GRES-1 and connecting tracks between the coal stations; also additional receiving and dispatch and sorting tracks. In addition, a number of the coal transport lines of the railroad were converted to electric traction, more than 1,000 kilometers were equipped with automatic blocking and dispatcher centralization, the capacity of the tracks was increased, and other measures were carried out to step up the yields from Ekibastuz coal.

A considerable amount of technical equipment was received by the coal production association Ekibastuzugol'. They introduced rotary excavators, including two with a productivity of 5,000 tons per hour. For the transporting of the coal we are using traction assemblies of the new types. The length of the tracks at the coal loading stations was increased by 140 kilometers over the length in the 10th Five-Year Plan and we built and put in operation nine new stations, equipped with devices for electric centralization and blocking. The track is being converted to progressive designs of the upper structure, with the use of ferroconcrete ties and rails of the heavy type. All this is helping to increase the shipment of coal from the pits.

A characteristic feature of the work in this region is the directing of the entire heavy flow of empty and loaded express trains through one railroad junction--Ekibastuz--since the unique deposits of energy coal are located in a single area. The loading into the railroad cars is carried out at the same time as the extraction of the fuel. In the pit the excavators, the rolling stock, and the other facilities make up what is to all intents and purposes a single coal-extraction and loading and transport complex. The maintenance of uninterrupted operation of this complex is the objective of the joint technology of the Ekibastuz coal setup, the coal-loading stations, and the pits of the association. It has also determined the organization of the labor activity of the related industry workers on the basis of the establishment of a single complex for the shifts of railroad workers and workers of the loading and transport administration (PTU) of the association.

A single shift at station Ekibastuz consists of the senior assistant chief of the station, the duty officer of the station and yards, the operators of the technical office, the senior receiving and dispatching personnel, the receiving and dispatching workers, the workers of the technical inspection

point, the train-compiling crews, the switchmen, the workers of the approach tracks, and others.

The management of the operational work of the shift is handled at station Ekibastuz by the station dispatcher and on the approach track by the PTU dispatcher. Well-coordinated work on their part is in many respects dependent on the fulfillment of the shift plans for the station and the approach track. The supervisors distribute the work to be done among the operational subdivisions of their shifts and take measures to prevent any possible bottlenecks. The shifts are given a single plan for the basic indicators and for the use of the rolling stock. The plan provides for the supplying of empty rolling stock to the pits, and on-schedule presentation of loaded coal express trains and dispatch of them from the station.

The results of the socialist competition of a single shift are compiled each month at a joint meeting of the executives of the Pavlodar branch of the railroad, the association Ekibastuzugol', and the pertinent trade-union committeees. The best combined shift is determined according to a point system. Each percent of overfulfillment or underfulfillment of the established plans is rated as one point. The collective of the combined shift which triumphs in the socialist competition is awarded a challenge Red Banner.

Thanks to the widespread development of socialist competition, the collective of station Ekibastuz successfully fulfilled the norms in the fourth quarter of 1981. Thus, the layover of a car for one loading operation conforms to the assignment, for a transit car with reprocessing it has been cut down by 18.3 percent, and for a transit car without reprocessing by 8 percent. For the successes achieved the collective of station Ekibastuz was awarded the challenge Red Banner of the MPS [Ministry of Railways] and the Central Committee of the Trade Union of Railroad Transport Workers.

In the socialist competition at station Ekibastuz superior results were obtained by the shift of station dispatcher S. I. Azerina, who in cooperation with the dispatcher group of Ye. Ye. Klyuyeva, has been regularly overfulfilling the production assignments by a margin of 10 percent. Everyday this shift has been fulfilling the assignments for the transport of local freight by 110-115 percent and the assignments for the delivery of empty cars for the loading of coal by 115-120 percent. The method of the Moscow Railroad for the formation and dispatch of cars was employed in 1981 by the collective of the shift for more than 2,000 heavy trains, which transported additionally more than 800,000 tons of national economic goods.

In the vanguard of the socialist competition has been State Prize Laureate train compiler P. N. Volovik. On 27 December, ahead of schedule, this leading compiler fulfilled his yearly personal commitment by dint of well-coordinated work with the duty officers for the station and yards, the receiving and delivery workers, the switching locomotive engineers, and the workers of the approach tracks. On the basis of the 1981 work results train compiler P. N. Volovik was awarded the title of "Best for the Vocation."

The cooperation in everyday work is manifested in the reciprocal information, in the help provided by the switching facilities, etc. Thus, when there are difficulties in the work of the station the coal workers use their own locomotive to transport the trains as far as station Chiderty; when a large number of empty trains arrive, the cars are assigned to the available tracks of the PTU station, etc. In turn, when there is need for it, the workers of the station supply a locomotive for the delivery of empty cars and for the display of loaded trains.

The scope of the work and its complexity required the development and improvement of the forms of labor cooperation. The collectives of the Ekibastuzugol' production association, of the Tselinna, Sverdlovsk, South Ural, West Siberian and Alma-Ata railroads, and of the Pavlodar, Karaganda, Sverdlovsk, Chelyabinsk, and Omsk regional power engineering administrations concluded a contract for the rhythmic delivery and the establishment of fuel reserves at the electric power stations. The purpose of this was the fullest possible satisfaction of the national economy requirements for electric and heat energy.

The value of this undertaking is found in the significance of the Ekibastuz fuel and energy complex in the country's economics and the possibility of repeating this experience in organizing the shipments of coal from other basins as well as the shipments of such bulky freight as ores, mineral fertilizers, etc. The workers of the related industries have taken on reciprocal commitments for stepping up the rhythmic character of the work of the coal pits and the effectiveness of the use of the rolling stock. The all-out competition has speeded up the delivery of Ekibastuz coal to the electric power stations, has cut down the losses of this coal in the shipments, and has improved the use of the cars.

The basis of the organization of fuel shipments is expansion of the area of turnover of the circumferential express runs between the coal-loading stations and the electric power stations. Also maximum reduction of the layover of trains and acceleration of their loading, unloading and travel through the sector. It should be noted that the circumferential express runs on the railroad were also made earlier. But before 1980 they encompassed a small area within the Tselinna Railroad, the Karaganda branch of the Alma-Ata Railroad, and the South Ural junction stations of the railroads. To expand the area of turnover and increase the number of specialized express trains on the railroad we determined the optimum variants for the operation of reserved trains and worked out compact schedules for their movement. We also made provision for the combining of shipments of coal and iron ore from the Lisakovsk and Sokolovo-Sarbaysk mining and concentration combines. This enabled us to reduce the extent of empty run of the express trains because the direction of the shipments of ore mainly coincides with their empty travel route. In addition, after one of these freight shipments there is no need for cleaning the cars before delivering them for the loading of other goods.

In the beginning period of the introduction of the new technology for coal shipments the railroad formed 126 trains made up of open cars with closed

bodies and transported in them about 50 percent of the extracted coal. Later the number of these was considerably increased.

The forward movement of the circumferential route express trains is carried out with the speed of passenger trains. The route speed of these trains reaches 1,100 kilometers per hour.

We worked out an efficient system for monitoring the forward movement of the circumferential express trains in the entire area of their turnover, including the Tselinna, South Ural, Alma-Ata, Sverdlovk and West Siberian railroads. On the Tselinna Railroad this control is exercised by the road dispatchers of the special "circumferential" group which monitors the progress of these trains throughout the roads involved in turnover on the basis of the chart of movement already accomplished. They also inform the dispatcher apparatus of the department recipients about the approach of loaded trains and in the case of Ekibastuz station about the approach of empty express trains for the purpose of planning the loading. The chart of completed movement notes the time of the circumferential trains' travel through the junction points of the roads, their arrival at the station of unloading, and their dispatch after unloading. Every express train is assigned a number and its progress is indicated on the charts by a special color. At the entry junction points the train returning to the road is checked out. Also the objective of attention are the safety and uniformity of the cars.

As a result of the strengthening of the cooperation of the related industry workers, the 1981 loading of coal on the road increased by 1.5 percent as against 1980, the yearly plan for the loading of coal was overfulfilled by 0.4 percent, and 885,000 tons of coal were transported over and above the plan. By virtue of the increase of loading in the closed circumferential trains, there were substantially increased the coal reserves at the electric power stations which require Ekibastuz coal.

The transport of coal in circumferential express trains formed of specialized open cars with closed bodies on roller bearings eliminated the additional loading preparation of the cars at station Ekibastuz and made it possible to dispatch them for loading at the pits without delays. Whereas full processing of a train formed from empty cars requires 3.8 hours, for the circumferential trains this time comprises 0.9 hours. This saves more than 6,000 car hours per day, which is equivalent to freeing about 200 cars daily for additional loading.

The level of routing of coal shipments has increased by 0.7 percent. The transport of coal in specialized open cars has made possible a substantial increase in the static load of a car, which enabled us to ship more than 183,000 tons of coal in the course of a year without using additional rolling stock. The indicators for the work of station Ekibastuz have improved. Thus, in 1981 the layover of cars for a single loading operation was reduced by 3.4 hours as against 1980, the working inventory of cars was reduced by 15 percent, and the balance of damaged cars was 19 percent below the norm.

To speed up the turnover of express trains, the fuel receiving enterprises, following the example of the South Ural transport workers, organized minor repair of rolling stock. Now all the cars are sent to Ekibastuz in a condition of full readiness for loading and whereas before the operation of reception of empty trains required the expenditure of 2-3 times the time called for by the norm, now every train is processed within 30 minutes.

The development of competition among the associated workers enabled us to provide for a steady supply of railroad cars for the loading of coal while at the same time reducing the operational inventory at station Ekibastuz. In the past years the association 'Ekibastuzugol', using the reserves available on the railroad, provided for additional loading of up to 180-280 cars a day. The sharp fluctuations in the number of cars delivered for loading were now not so apparent. After that, with a considerable increase in the volume of coal shipments, the amount of reserves was reduced; in 1980 an average of 112 additional cars a day were put in operation and in 1981 only 40 cars.

In this connection, the task of rhythmic delivery of railroad cars for loading by hours, days and ten-day periods is one of the chief tasks of the railroad workers for successful fulfillment of the plan at a particular time. The contract calls for a stricter discipline on the part of the workers of the organization on the roads along which the circumferential trains travel. Violation of some of the stipulations of this contract leads to a violation of the system in the loading of coal.

The contract of the associated organizations is helping us to look for additional loading resources when, because of regular nonfulfillment of the regulation assignment, the railroad and the association find themselves in a very difficult situation. With 1981 receipt of open cars more than 119,000 short vis-a-vis the over-all regulation, the road, by using the supplementary reserves, was able, jointly with the association 'Ekibastuzugol', to reduce 4-5 fold the unfavorable effect of nonfulfillment of the regulation. To provide for a steady supply of loading resources to the coal pits they have increased their loading "for themselves" and are investigating the possibilities of limiting the loading of other goods in the open cars. By this means alone in 1981 the road obtained more than 32,000 cars for the loading of coal.

For the achievement of high final indicators exceptionally great importance attaches to the cultivation of a conscientious attitude toward fulfillment of the provisions of the contract of the participating associated railroads. The workers of the West Siberian Railroad approach this most important undertaking with a feeling of great responsibility and they are providing for unimpeded traffic of the circumferential trains carrying Ekibastuz coal to the electric power stations and for on-schedule return of them empty. At the same time, the proper attention is not being given to the unimpeded movement of the circumferential trains on the Alma-Ata Railroad. In 1981 alone the railroad held up for a period of 12-15 days 45 circumferential trains which were used for loading of not just coal but other products as well. In addition, the road formed 19 circumferential trains for this work. The result is a

violation of the commitment for supplying loading resources to the Tselinna Railroad and the engendering of a serious situation with respect to fulfillment of the contract of the associated workers.

During the competition the associated workers suggested shipping the coal to the electric power stations which are included in the Pavlodarenergo [Pavolar Energy] system as per the rigid threads of the chart. The technological basis for this measure has been prepared.

The new technology will to a considerable extent help to accelerate the transport of coal. In addition, it will significantly improve the use of the loading and unloading equipment, expedite the turnover of the rolling stock, step up the level of unloading of cars in the first half of the day, create favorable conditions for the repair and preventive maintenance work on the large complex of mechanisms and machines in the Ekibastuzugol' association and in the electric power stations, and increase the labor productivity. In the future the system of coal shipments as per the rigid threads of the chart will also make provision for including other consumers in the region being served.

At present coal is shipped to the GRES installations in four-axle open cars, which significantly complicates the Ekibastuz coal work, does not allow for fuller use of the traffic capacity of the lines and leads to cutting in half the capacity of the GRES coal-receiving complexes as compared to the shipments in eight-axle cars as stipulated by the technical plan of the Ekibastuz GRES. An important task is therefore the introduction of this progressive rolling stock.

Participating in the competition of the associated workers, along with the workers of the association, are the Tselinna Railroad collectives which handle the shipment of coal and the movement of the empty trains proceeding for loading. In accordance with the commitments assumed by them, the workers of the Tselinograd, Pavlodar and Kushmurun railroad car depots reduced by 5-7 hours the time of layover for processing of loaded coal trains and express trains. They also increased two-fold the length of the sectors in which the express trains proceed without inspection and processing at the technical stations. The collective of the Yesil' track division initiated the acceleration of the travel of the empty open cars and coal express trains. Improving the organization of current maintenance of the track guaranteed maximum speed for the loaded express trains and passenger train speed for the empty trains. The workers of the Kushmurin, Yesil', Atbasar, Akkul', and Yermentau stations reduced by 40-60 percent the stopping of empty express trains.

The strengthening and creative development of cooperation required reviewing the management of the shipment process within the ASU [automated control system] which has been set up for the railroad. At present, through the computation center of the railroad, automated control is exercised over the condition and disruption of the operation of the closed circumferential coal, ore and oil express trains which circulate within the Sverdlovsk, South Ural, Kemerovo, West Siberian, Alma-Ata, Central Asian and Tselinna railroads. Provision was made for the transmission of information about all the facts pertaining to the circumferential express trains as this information comes

from the branches of the Tselinna Railroad and the computation centers of the neighboring roads. Provision has also been made for processing of this information on the Minsk-32 EVM [electronic computer] twice daily.

However, the increase of Ekibastuz coal shipments requires further improvement of the automated control system for the shipment process in respect to the planning and accounting work of the stations and coal enterprises, the drawing up of shipping documents, the calculation of freight payments, and the statistical reports, including the types of layover at the stations of the center and on the tracks of the enterprises. There is also need to organize the exchange of information with the information and computation centers of the Ekibasugol' association, the local GRES installations, and later also the ASU of the power engineering enterprises. It is also necessary to jointly develop programs and solutions for the common problems, using a single data bank.

In the future this will be an intersectorial control system for the entire extent of the production cycle of extraction, transport and consumption of energy coal. For the technical maintenance of the program we plan to set up a junction computation center [UVTs] and a network for the transmission of data. In the area of station Ekibastuz I we will construct a UVTs building, lay cable, and install terminal equipment at all the installations and enterprises.

In the 11th Five-Year Plan we have to solve the problem of uninterrupted EVM monitoring of the traffic and changes in condition of the empty and loaded coal and ore express trains within the limits of all the roads where they operate. Also to be monitored is the movement of empty overall network express trains on the Tselinna Railroad in a system of actual time and numerical accounting of the delivery and return of the cars on the tracks of the Ekibastuzugol' and the GRES. This will enable us to establish in the EVM memory a dynamic model of the delivery of Ekibastuz coal to the consumers. We will also obtain in a dialogue mode any data on these subjects needed for predicting, planning and monitoring the coal shipments.

The collectives of railroad, coal and power engineering workers, striving to suitably observe the 60th anniversary of the formation of the USSR, have concluded a new contract for socialist competition. They are increasing the extraction and delivery of fuel to the electric power stations and they are striving to achieve a fuller satisfaction of the national economy requirements for electric and thermal energy.

Improving Condition of Wheel Pairs

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[Article by Candidates of Technical Sciences V. N. Shorenko and N. I. Martynov:
"Improving the Technical Condition of the Wheel Pairs"]

[Text] Maintenance of the safety of movement of trains under the conditions of increased loads and speeds is to a considerable degree dependent on the technical condition of the wheel pairs of the cars. In light of this, various scientific research organizations, railroads and industry have done a great deal of work to improve the technical condition of the car wheel pairs and to increase their reliability and durability.

In the course of a systematic restructuring of railroad transport, by 1970 we had fully removed from operation the wheel pairs with cast iron wheels and centers and by 1977 those with tire wheels. Also helping to achieve a significant increase in the dependability of the wheel pairs was the introduction of hardening milling which enabled us, in addition, to repair axles which have transverse cracks or the slanted ones relevant to them in the accessible parts by means of the machining and subsequent knurling of them.

Because of the mass conversion of the rolling stock to roller bearings we worked out several variants of axles: axle type RU—unified for freight and passenger cars with 135 x 280 x 93 mm pins under the two bearings and axle type S-IV Roller-freight and passenger—with 130 x 250 x 80 mm pins in a bush bearing fit under the two rollers with front nuts reinforcing the rollers. Later, after correction of some of the sizes, the axle type S-IV Roller was designated RU I. Along with this design we adopted as standard beginning in 1979 the axle with front reinforcement by a bearing washer and M 20 bolts (designation RU1Sh). To expedite the conversion of the car inventory to roller bearings we adopted GOS 4835-80 "Wheel Pairs for Cars of Mainline Railroads with 1520 (1524) mm tracks." The technical specifications called for again forming wheel pairs only with type RU1 and RU1Sh axles. Thus, the number of standard sizes of wheel pairs for freight and passenger cars was in 1980 reduced to two.

Analysis of the breakdowns of wheel pairs of trains en route shows that every year there are registered isolated cases of breakdowns of wheels and axles. Nonetheless, we have taken measures for increasing the durability of the axles and removing those of the old type from operation. In particular, we have improved the quality of the metal in the axles (GOST 4008-79) and have made provision for elimination from the inventory of axles which have mechanically unprocessed (forged) middle parts, etc. The research established the fact that breakdowns of axles in accessible and middle parts take place mainly because of the failure to discover old cracks in time. This is proof of the need to improve the quality of the defect spectroscopic examination of the wheel pairs at the repair enterprises as well as the need to strengthen the control over the observance of technological discipline. The main reasons for the breakdown of wheel discs are their inadequate strength as a result of defects generated in manufacture and the increased dynamic loads

(especially in the winter time) stipulated by the appearance of defects in the surface of the rolled metal of the wheels: slipping and nonstandard dimensions of the rolled metal, etc.

Analysis of the data on uncoupling of cars shows that every year in the 1976-1979 period saw the presentation for current repair on malfunctions of the wheel pairs, including scoring of the pins and overheating of the axle bearings, on 16.5-28.2 percent of the total number of cars uncoupled for all the types of malfunctions. In 1976 the number of uncouplings for this reason began declining and at present it comprises 10.2-12.1 percent of the total number of uncouplings of cars. Approximately the same trend has also been observed in the uncoupling of cars because of defects of the wheel pairs without overheating of the axle bearings and scoring of the axle pins. In the 1976-1979 period 5.3-6.9 percent of the total number of cars came into current repair for this reason. The largest number of uncouplings for current repair is noted for open cars, 17 percent less for tank cars, and the least for covered cars.

On the basis of the results of the analysis of the cars coming in for current repair on various defects of the wheel pairs it was determined that most often (73.8 percent) the cars were uncoupled for wheel defects caused by the action of the brakes: built-up metal and slipping and wear of the collar bearings. And the most common defect is the build-up of metal. It accounts for 62.4 percent of the uncouplings of open cars and 70-75 percent of the uncouplings of tank cars, covered cars and flatcars. The rolling, cutting and milling of the flanges were involved in 19.1 percent of the uncouplings of cars, cracks 1.6 percent, and other defects 9.5 percent. A comparison of the data for 1976-1979 and for 1965-1975 shows that the total number of uncouplings (calculated for each 1,000 cars of the operating fleet) changed a negligible amount in the last 12 years. However, the number of uncouplings for all the types of brake defects of the wheels increased 1.6-fold and for metal build-up 5.5-fold. At the same time it declined to 10/17 of the former figure in the case of wear and tear of the wheels.

As a result of the 1980 inspection of freight cars in operation it was revealed that on approximately 35 percent of the cars there were installed at the same time both cast iron and composition brake shoes. Thus in each car with brake lever transmission regulated on composition shoes 2-3 cast iron shoes are also used. This leads to the development of such defects on the surface of the rolled metal of the wheels as metal build-up, ring wear, slipping, etc. In light of these facts, there is need to drastically strengthen the control exercised over the correctness of the installation of the brake shoes and to take measures to step up the quality of the repair and maintenance of the automatic braking equipment of the freight cars and to make further improvement in its design.

The condition of the wheel pairs in operation was assessed on the basis of the results of the inspection of the freight trains in operation. The average sizes of the rolled metal of the wheels were 2.9-3.1 mm for open cars and covered cars, 2.8-3.0 mm for flatcars, and 3.5-3.7 mm for tank cars. As we see, the difference in the average size of the rolled metal of the open cars and flatcars is negligible. The average rolled metal of the wheels of tank

cars is 21-24 percent more than the other types of cars, a fact which is due to the predominance of wheel pairs with sliding bearings under these cars. The wheels with rolled metal of less than 5 mm size comprise 92 percent and those with rolled metal of more than 5 mm size about 8 percent (including 1 percent with rolled metal of more than 7 mm size).

According to the measurement data of 1956 and 1964 the network average of rolled metal of the wheels was 2.4 and 2.7 mm respectively and in 1980 it increased to 3.1 mm. The increase in the network average of rolled metal is due mainly to the more frequent use of wheels which are unmachined throughout the structure. Resulting from this is a reduction in the frequency of the use of wheels where there is an average unproductive loss in the thickness of the wheel rims in the form of chipping and consequently a decline in the service life of the wheels.

The measurements also showed that the network average thickness of the flange is 31.3 mm (with a norm of 33 mm). The wheels with a flange thickness of more than 30 mm comprise 97 percent and those with a flange thickness less than 30 mm only 3 percent. The average thickness of the wheel rims of open cars is in the 58-59.5 mm range, of covered cars 57.3-58.7 mm, flatcars 57.8-59.2 mm, and tank cars 54.2-65.8 mm. For all the types of cars the average thickness of the wheel rims on wheel pairs with roller bearings is 10-18 percent more than on wheel pairs with sliding bearings. This is due to the fact that the wheel stock is constantly filled with new wheel pairs with roller bearings while the number of wheel pairs with sliding bearings is declining.

In 1979 approximately 3.11 percent of the wheel pairs of the cars which came in for current and planned types of repair were serviceable and not in need of repair. It should be noted that in 1970 there were considerably more of these--8.24 percent. This is evidence of an increase in the number of defects in the wheel pairs. As we know, provision has been made for two types of repair of wheel pairs--without replacement and with replacement of components; the overwhelming majority of the wheel pairs (about 95 percent) fall in the first of these categories. It has been determined that from 1970 to 1979 there was virtually no change in the total number of wheel pairs brought in for both types of repair. At the same time, the total number of wheel pairs brought in for repair involving replacement of components increased practically continuously and by 1979 had increased by 33.5 percent. Because of this, we should go on reinforcing the capacities for wheel pair repairs involving replacement of elements.

Depending on the condition of the surface of the rolled metal taken from under the cars, the wheel pairs are divided into two groups: those requiring and those not requiring machining on a wheel lathe machine tool. It has been determined that on the average 59 percent of the wheel pairs do not need machining, 32.7 percent are machined at the place of rolling, and the rest are sent for complete overhauling of the axle roller boxes and replacement of components to other points and are returned to the point of rolling with machined parts. The average rolling of machined wheel pairs is done at an interval of from 5.33 to 5.56 mm. The wheel pairs with rolling of less than 5 mm comprise 35 percent and those with rolling of more than 7 mm about 20

percent. On nearly half of the machined wheel pairs the difference in diameters of the wheels exceeds one mm--the maximum allowance in the rolling of the wheel pairs under the cars getting planned and current repair.

Among those repaired 21.5 percent of the wheel pairs have round blistering on the face and small local splintering. Repair of the wheel pairs with these defects and rolled metal of up to 7 mm is usually limited to restoration of the face on a wheel lathe machine tool without machining throughout the structure. Thus, according to the data of the Moscow railroad junction, on 17.8 percent of the wheel pairs removed from the wheel lathe machine tools the face was restored without machining in the circular rolled area.

Nearly all the machined wheel pairs with defects and with maximum rolling have on the rolled surface of the wheels sections with increased hardness to a depth of 1.5-2.0 mm. The machining of these wheel pairs is accompanied by large impact loads which have an adverse effect on the cutting instrument and the machine-tool equipment. There also arises the need in the processing of the wheels to employ a cutting tool to cut under the hard sections and to remove a larger (than is technologically necessary) layer of metal. Research determined that an average of 3-4 mm of useful metal comes off each wheel in the chipping, which is equivalent to approximately 100,000 kilometers of operational travel.

One of the most effective methods of improving the machining capacity of the wheel steel is the use of multistage tempering of the upper layers of the metal of the rolled surface of the wheels by heating them prior to the machining with high-frequency currents (TVch) to a depth up to 2 mm. Thermal processing with TVch possesses the following basic advantages over the other methods: negligible overall heating of the wheel pair components, which does not weaken the press coupling; prevention of further development of heat cracks, which occur in the surface layer before the tempering; the possibility of doing the thermal processing on a wheel pair repair flow line with a resulting high productivity of the process; and other advantages.

On the basis of continuous and sequential tempering (rolling method) the Leningrad Institute of Railroad Transport Engineers, jointly with a number of scientific research organizations and the Oktyabr' electric car repair plant, worked out and implemented a new technology for the restoration of the structure of the rolled surfaces of the wheel pairs. (See ZHELEZNODOROZHNYY TRANSPORT, 1980, No 10). The operational tests showed that the wear and damage susceptibility of the rolled wheel surfaces machined with high-frequency currents was the same as on wheels machined according to the existing technology. The tests did not turn up any defects in the discs and naves of the wheels or any reduction in the firmness of the press fit of the wheels on the axle. The technical-economic calculations show that as a result of the electric tempering with high-frequency currents (TVCh) the losses from chipping when machining the wheels because of slipping and maximum rolling is reduced by half and by two-thirds in the case of build-up of metal. As a result of this, the service life of the wheels is increased by 27-30 percent, the volume of the pressing and pressing off work is reduced, and there is achieved a saving of approximately 30,000 tons of metal for each million wheel pairs in the operational inventory. The use of TVCh electric machining on induction units is economically desirable when the machining is for 1,000 and more wheel pairs a year.

At the present time TVCh induction annealing is recommended for extensive use when restoring sections for the rolling of wheel pairs. To accelerate the introduction of this progressive method it is necessary to provide for the manufacture of induction units and for the delivery of them to the repair enterprises.

Every year some of the axles and wheels are eliminated from the inventory because of various defects. In 1980 axles for sliding bearings were rejected mainly because they reached the maximum diameter for an accessible part (55.04 percent), because of burning and scoring of the pins (13.37 percent), and because of damage to the electric welding of middle parts (8.08 percent).

The relationship between the reasons for eliminating wheel pair axles for roller bearings from the inventory are substantially different from what was noted above. The largest number of axles was rejected because of wear and damage of the thread of the front reinforcement (50.39 percent), cracks in the pins (13.43 percent) and burning of the electric welding (9.17 percent). At the same time, the rejection of axles for these defects can in many cases be avoided. There is no reason at all, in our opinion, to put up with instances of electric fires. The solution for this problem is well known: it is essential to strictly obey the established rules for the performance of electric welding work, especially at the points of technical servicing of railroad cars and in current uncoupling repair.

We cannot accept as normal the fact that 50 percent of the rejected axles for roller bearings are eliminated from the inventory because of wear and damage of the thread. The All-Union Scientific Research Institute of Railroad Transportation (VNIIZhT) developed an installation and worked out a technology for the repair of wheel pairs which have worn or damaged thread. This technology was successfully tested at the Oktyabr' electric car repair plant. It is essential to make provision for mass use of such installations at the repair enterprises of the MPS. Along with the weld scanning, it is also desirable to begin converting such axles into axles with front washer reinforcement.

It was determined that there has been a constant decrease in the proportion of wheel pairs eliminated from the inventory because of the appearance of cracks in various parts of the axles. For example, whereas in 1970 the number of these amounted to 54.17 percent and in 1975 to 24.42 percent, in 1979 it was less than 14 percent. Cracks were most often found in the axle part subjected to the greatest strain--the accessible part (68.35 percent according to the 1979 data), more rarely in the rail webs (18.59 percent) and considerably more infrequently in the middle part (12.96 percent). This data gives evidence of the effectiveness of the measures taken to increase the hardness of the axles: the introduction of reinforcing knurling throughout the length, the increase of the dimensions of the axles in the accessible and middle parts, more qualitative rounding of the edges of the faces of the wheel naves, etc.

In the majority of cases the rejection of wheels is due to the reaching of the maximum permissible thickness of the rim (92.35 percent). The average thickness of the rim of the wheels eliminated in 1980 was 26.3 mm, which was approximately 1.5 mm less than in 1970. This is evidence of a fuller use of the wheel rims.

Recent years have seen an increase in the number of wheels rejected for every 1,000 wheel pairs inspected. This trend is largely the result of widespread use of composition brake shoes, which generate increased braking effectiveness (as compared to the cast iron ones). In a number of the railroad sectors with a higher coefficient of coupling, for example, because of dirtying of the rails by skidding lubricant, the use of composition shoes leads to an increase in the frequency of occurrence of defects in the wheels (metal build-up, chipping, etc.). Because of the fact that in the machining of wheels with such defects a larger layer of metal is removed than with machining for normal wear (rolled metal), the elimination from operation of wheels with meager machining becomes more of a large-scale practice. To reduce the frequency of rejection of wheels for this reason, it is necessary to provide for further increase of wear resistance and resistance to the formation of defects on the rolled metal surface, to eliminate the combined operation of cast iron and composition shoes, and to expedite the conversion of the rolling stock to roller bearings, thus eliminating the dirtying of the rails by skidding lubricant.

An important task is expediting the introduction of the VNIIZhT-developed norms differentiated according to the nature and types of the repair in the rolled metal of the wheel pairs to be given depot and capital repair. In comparison with Regulation TsV/3429 these may have a permissible thickness of wheel pair machining of from 27 to 30 mm for two-year repair. For the wheel pairs of open cars and tank cars the size of the rolled metal is reduced from 5 to 4 mm when there is two-year repair and increased from 5 to 6 mm for all the types of cars when the repair is being done in one year.

Along with the work for improving the maintenance of the wheel pairs in operation and enhancing the technology for their repair, the VNIIZhT, in collaboration with other organizations, is constantly carrying out complex research for the development of new designs of wheels and axles and improvement of the technology for their manufacture. Thus, the railroad network is doing operational testing of hollow car axles, the technology of which employs the transverse-screw rolling method developed at the Dneprodzerzhinsk metallurgical combine along with axles with cylindrical middle parts.

An evaluation is being obtained under operational conditions to determine the strain resistance capacity of the wheel with the curved type of disc and a solution has been arrived at in the matter of devising a theory which takes into account all the operational, design and technical factors. We have stepped up the work of converting all the rolling stock of the railroads to the new (common to cars and locomotives) structure of the wheel for the rolling cycle. The chief characteristic feature of the new structure is an increase in the angle of slant of the flange from 60 to 65 degrees, which results in a significant increase in the stability of the wheel pair and increases the period of service between machining operations.

As a whole, analysis of the malfunctions of freight car wheel pairs in the 1960-1980 period shows that thanks to the work done in this period and in particular the introduction of the new GOST specifications for axle, wheel and wheel pair and the normative-technical documentation for the manufacture, repair and maintenance of them, their general technical condition has been

considerably improved. At the same time, there are still serious deficiencies the elimination of which will contribute to further increase of the reliability of the wheel pairs in operation and consequently also the safety of the movement of the trains.

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7962
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RAILROAD

BAM'S ENVIRONMENTAL IMPACT

Moscow STROITEL'NAYA GAZETA in Russian 3 Oct 82 p 3

/Article by V. Vorob'yev, corresponding member of the USSR Academy of Sciences, director of the Geography of Siberia and Far East Institute, Siberian Division of the USSR Academy of Sciences, and A. Naprasnikov, candidate in geographical sciences, senior scientific staff member: "The BAM's Natural Environment"/

/Text/ Although construction of the vast BAM is still not complete, on the sections which have already been built work is being developed with respect to assimilating the abundant resources of the BAM zone (the southern Yakutak coals, the forest resources of Irkutsk and Amur Oblasts, Khabarovsk Kray, and other regions). It must be borne in mind, however, that transportation and industrial construction has a strong influence on the natural environment of these regions. This places the question of environmental protection in the BAM construction zone among our most important problems.

We must have a clear and careful picture of what changes are being introduced to the surrounding natural complexes by the mainline itself. At the same time, we must study the natural processes which could prove to be dangerous for the mainline to a certain extent. Construction of the BAM entails a specific transformation of the natural environment. Let's say, the violation of the natural heat regime of the soils and rocks leads to a thawing out of the permafrost and the development of thermokarst. Timber cutting and possible forest fires cause changes in the most productive plant associations, the migration or death of valuable animals, the formation of snowslides, mudslides, and the shifting of earth on slopes. The construction of mining enterprises, plants, cities, and workers' settlements is transforming landscapes and bringing about a change in the micro-climate, along with pollution of the atmosphere, rivers, lakes, and underground waters. This all needs to be counteracted.

Already in the first stage of natural-environmental protection operations their thrust was correctly defined, and we managed to avoid major violations in the natural environment of the BAM zone. But during the mainline's construction new situations arose, requiring serious analysis. Deserving particular attention among them are the evolution of the permafrost, the problems of protecting the water and air basins, and the economic problems of environmental protection.

Such a natural phenomenon as perennially frozen soil can and should become a reliable foundation for the railroad and the engineering structures. It can, if we

protect the frozen soil, without allowing it to deteriorate. The builders of the mainline have more or less observed this rule, as applied to highways or railroads. But the adjacent area is, obviously, still of too little concern for them. And this is unfortunate. Tractors and all-terrain vehicles, trucks and ditch-diggers tear off the upper, heat-insulating cover ruthlessly, and the destruction of the permafrost can already be seen in a number of places. Gullies and ravines are already rapidly coming into being and increasing, to be sure, as yet still only along side the new roadbed. But in the future they could even threaten the roadbed which is now being measured out. Moreover, on the Khani--Chara section notice has already been taken of the quite significant consequences of neglecting frozen soil and water-caused erosion.

Linear erosion, caused by the harsh conditions of soil freezing, has developed more intensively in the Charskaya Trough than it has in the southern part of the Trans-Baykal Region. And it must be combatted without losing any time. The builders must also take into consideration the fact that in the not-too-distant future the perennially frozen soil on the greater part of Siberia's territory could disappear, and then many engineering structures built on it would be deformed and, possibly, destroyed.

According to the studies of the staff associates of the Institute of Permafrost Research of the Siberian Division of the USSR Academy of Sciences, I. Nekrasov and I. Klimovskiy, it has been revealed that, in connection with a natural warming trend during the last 50--60 years, the southern boundary of the compact spread of permafrost is shifting in a northerly direction. If we adopt as a basis the conception of the prominent Soviet climatologist, M. Budyko, concerning the significant anthropogenic role of carbon dioxide in the warming of the climate, then by the year 2000 on most of the territory of the present-day spread of perennially frozen soil it will actually disappear. It will be maintained only thanks to the stabilizing and conservational role of vegetation, soil cover, and water. We have been put on alert by the circumstance that under some engineering structures the frozen soil has already deteriorated. We need to conduct comprehensive frozen-soil geographical studies which would permit us to forecast the development of frozen-soil processes.

Calls for protecting the permafrost have been directed at all the organizations operating in the BAM zone without exception and, above all, to the surveyors and builders. At present violations of the natural conditions for the existence of permafrost are allowed by all the services working here, while practically no one bears responsibility for this.

Serious alarm has been caused by pollution of the water resources within the BAM zone. The waste products of economic activities and industrial facilities are "transported" for hundreds of kilometers down the rivers. Furthermore, the experience in using the water sources in the Yakut and Buryat ASSR's, as well as in the Chita and Amur Oblasts, testifies to the weak self-purifying capacity of the waters being utilized here. The low temperatures and weak biological activity of the waters substantially reduces the process of their self-purification, while the great velocities of the mountain torrents facilitates the bearing of heavy, suspended particles. In Siberia, therefore, the influence of polluted river waters spreads to larger territories than is the case in regions where the climate is moderate.

Layers of ice could become a real misfortune for the mainline. On practically every kilometer they will affect the railroad bed and the motor-vehicle highway. This was manifested clearly last winter. Within the bounds of the Charskaya Trough a considerable portion of the railroad's right-of-way was under ice. Even heavy-duty, up-to-date equipment was incapable of overcoming it. The appearance of ice layers is a reaction of over-moistened landforms to a violation of their hydrological regime. In order to combat this, we must take anti-icing measures which have been proven effective by life, for example, frozen-soil belts, built at some distance from the mainline. They would be able to take upon themselves the entire load of the ice layers, thereby protecting the engineering structures. It is also high time to be convinced of the effectiveness of partially replacing waterpipes to the bridge spans.

In short, the need has arisen to create not only an anti-icing service but also a comprehensive, mainline, natural-environment-protection service, which would ensure the forecasts of unfavorable natural phenomena (ice layers, thermokarst, water and wind erosion, fires, etc.).

It should be borne in mind that the BAM's prospective sphere of influence is not limited to those administrative rayons which are cut through by the right-of-way or which adjoin it. The process of transforming the natural environment will be extended to the northern and northeastern parts of Siberia. Numerous natural resources will be drawn into economic circulation. Difficult damages to the natural environment (in particular, unjustified timber cutting and pollution of bodies of water) are most characteristic for the initial period of assimilation. We need a system which plans and designs ahead of time the preparation of the economic development of new regions.

Functioning in the USSR is an entire complex of laws concerning the protection of the natural environment; in their aggregate they have created a good foundation for establishing rational inter-relations between the development of production, the environment, and people's living conditions. The whole thing lies in carrying them out in an unwavering and universal manner. The deviations fixed in the altered natural systems allow us to determine the influence of the economic activity on the natural environment and to work out measures for the protection and rational utilization of its structural components.

Protection of the natural environment on the BAM is a matter not of any one department or any monitoring institution but rather a task for all the ministries and organizations operating within the region without exception. Each of them must provide special allotments for environmental protection, as well as assimilating them completely and on-schedule. At the same time, monitoring departments ought to be strengthened. In our opinion, the functions and rights of Goskomgidromet should be expanded.

Opinions are sometimes expressed that, inasmuch as construction of the mainline is already nearing completion, the proposals regarding the protection of its environment have come too late. Of course they are very late, but only partially. In the future the operation of the railroad and the research being conducted will help us to carry it out more correctly and effectively. Also ahead of us is work on assimilating the natural resources of the BAM zone. Nor must we forget that the BAM

constitutes an enormous scientific proving-ground on which natural-environmental-protection measures are being worked out for the future assimilation of the entire northeastern part of the country.

It is evident that the need has already arisen to create not simply an anti-ice-layer, anti-avalanche, permafrost service but also a comprehensive, environmental-protection service, made up of specialists from various scientific sectors and ensuring the forecast of unfavorable natural phenomena. It is also obvious that we need a special organization of the Ministry of Railways which would be operationally capable of conducting preliminary investigations and to quickly eliminate the violations of the environment which arise.

The BAM is being built. The magnificent plans of the party and the government are being implemented. The builders are accomplishing a truly heroic deed, erecting under unfavorable natural conditions the largest facility of the century. The joint task of science and practical work consists in the harmonized implementation of theoretical and engineering achievements, in working out joint optimum plans for the inter-action of nature and the economy.

2384
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RAILROAD

OBTAINING EMPTIES PROBLEM IN COAL SHIPMENT

Moscow GUDOK in Russian 6 Oct 82 p 1

[Text] At the present time there is no more responsible task than building up reliable winter stocks of coal and petroleum products at power stations, plants and factories. The growth of the output of industrial enterprises, their successful completion of plans for the second year of the 5-year period and a confident beginning on the third depend to a large degree on a full supply of energy resources to the key sectors of the economy.

National interests put fuel shipments in the foreground. Today this is becoming particularly urgent. As the cold weather comes on, there is a sharp rise in the demand for coal and petroleum. As always, principal reliance will be on the Donbass and the coalfields of Siberia and Kazakhstan. Much is expected of main rail lines serving them in this situation. Unfortunately, the state of affairs in this area is a cause of concern. Above all because of the unsteady rhythm of the fuel conveyor.

The analysis of the results for September is persuasive in this regard. Take the Donetsk Railroad. The railroad "stumbled" during the first two 10-day periods in the month, falling short in delivery of empties to shippers. Thereafter the situation was corrected, but still they did not manage to make up what had been lost. On the Kemerovo Railroad, by contrast, September showed a fairly good beginning—460 gondola cars of coal were shipped over and above the plan. Then there was a disruption. The shipment of fuel increased again in the very last days of the month. Spurts and drops were also typical of the Virgin Land, Alma-Ata and Krasnoyarsk Railroads. And although the ice, as they say, melted toward the end of the month, the main coal-carrying railroads were unable to altogether make up what was lost. The network as a whole failed to deliver more than 1.87 million tons of solid fuel to the country's economy. The lion's share of that quantity is charged to the principal coal-carrying roads: the Donetsk, the Virgin Land and the Kemerovo.

What is the reason for this arrhythmia, this "swing" in fulfilling targets? There are many of them. They are moreover typical not only of the roads we have enumerated, but also of other main rail lines. The main one is the shortage of gondola cars. Indeed the shortage of them is very great. They are needed to carry metallurgical ores, timber, beets and other products. But still the directive of the ministry should be carried out most strictly: "Gondola cars are to be loaded first with coal!"

Unswerving observance of discipline in the disposition of empties is important here. The coal-carrying railroads are being placed in a problematical situation by the directors of those main lines which are holding back on the transfer of empties. It is difficult to expect success, say, from that same Donetsk Railroad, if it obtains from neighboring roads 500 or more gondola cars a day fewer than it was supposed to. And you cannot immediately load even those which arrive. One cannot fail to be disturbed by the fact that every other car turned over to the Debaltsevo department from the Southern, North Caucasus and Southeastern Railroads is in need of repair.

The issue of poor discipline in the disposition of empties is not new. But as in the past it is acute. And it is characteristic that one and the same roads end up being debtors month after month and quarter after quarter. As a rule they include the Sverdlovsk, the Alma-Ata, the October, the Southwestern, the Azerbaijan, the Far Eastern and the Transbaykal Railroads.

On some of these main rail lines empties assigned to through shipments are even being found. The feeling for localism has here been placed above the interests of the entire rail system. The main traffic administration should have a strict accounting with those who look on a matter of state importance only in the light of their own interests.

Now when the gondola car has risen sharply in price, the pace needs to be stepped up in unloading it. Attention should be paid to this both by railroad personnel and also personnel on sidings. The former must organize rapid delivery of local freight, and the latter make the rolling stock available as quickly as possible. But that approach to the effort is by no means taken everywhere as yet. Even on the coal-carrying roads themselves, which have been complaining of a shortage of empties, local loading resources are underutilized. This is the case on the Donetsk, Alma-Ata, North Caucasus, Kemerovo and a whole series of other roads.

And it is not uncommon for consignees to disrupt things. Here is an example, coal from Ekibastuz is delivered mainly to power stations on the Virgin Land, South Urals and Sverdlovsk Railroads. But often trains carrying the fuel stand idle beyond the allowed time at the power plants. After all they are delivered there on a round-trip basis--a progressive measure that speeds up the rate of the coal conveyor. When this attitude is taken toward the round-trip cars, their efficiency is lost. This is a case where railroad personnel have to put a greater demand on their clients.

It is well known that the successful shipment of fuel depends in large part on the smooth interaction of shippers, railroad personnel and consignees. This is especially important in cold weather. That is why thorough checks must be made time and time again to see that stocks of chemicals used to prevent freezing are built up in coal mine loading areas, to see whether drying units are in readiness, and to see that auger equipment used to break up frozen coal and thawing devices are in readiness at power stations and plants. A more vigorous posture is needed here both on the part of railroad personnel and also those with whom they deal. The community, people's control personnel, and trade union activists should be enlisted more widely in this effort.

They are being given a large field of activity now that the network review competition for the preservation of cargo is taking place. After all, the smaller the losses of coal and petroleum in loading, shipment and unloading, the fuller the winter stocks will be. Unfortunately, there are still quite a few cases where tons of fuel are left in cars and tanks after unloading, and often they are not used at all. War needs to be declared against this kind of wastefulness everywhere.

The efforts of those who deal with the railroads need to be directed at the present time toward mobilizing internal potential and toward its thrifty use. In October the network plan for loading coal increased by another 600 cars per day. It is gratifying that from the very first such large coal-carrying roads as the Donetsk, the Kemerevo, and the Virgin Land set a good pace--they have been successfully coping with the higher targets. Their regular supply of empties is contributing largely to this. But the first disturbing symptoms have already appeared: hundreds of cars are not reaching the Donetsk and Virgin Land roads under disposition orders. Again arrhythmia, again the "swing." Every effort needs to be made so that the railroad personnel attending the fuel conveyor perform their duty with honor.

7045

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RAILROAD

LOCOMOTIVE PARK: CURRENT STATUS, MAINTENANCE

Moscow GUDOK in Russian 12 Oct 82 p 2

[Interview with Yevgeniy Gregor'yevich Dubchenko, chief of the diesel administration at the locomotive park of the Ministry of Railways, by GUDOK correspondents V. Volkov and Ye. Malyuta: "The Diesel Locomotive on the Road and in Repairs"; date and place not specified]

[Text] An analysis of the operation of all the staff services in railroad transportation (as indicated by the mail received by GUDOK) shows that the locomotive park of the railroads, whose technical condition is still not on a high level, is being inefficiently used this year.

[Question] As is well known, diesel locomotives are handling almost half of all the freight and passenger traffic and about 90 percent of the volume of switching work. The uninterrupted operation of rail transportation depends in large part on the operating reliability of these locomotives. Yevgeniy Gregor'yevich, please describe the condition of the park of the network's diesel locomotives at the present moment.

[Answer] Our park is no longer young: about 70 percent of all the diesel locomotives have been in operation for more than 10 years. The oldest of them--the TE3 and 2TE10L in the first generations--are concentrated on the Northern, October, Baltic and Southwestern roads: that is, where a fairly good repair capability has been built up. The collectives of the depots of those main rail lines are doing a great deal to keep the locomotives in proper technical condition so that they prove themselves to be reliable in operation.

The most up-to-date park of diesel locomotives is on the Southern, the Donetsk, and the Southeastern roads, and recently the Central Asian has received many new locomotives.

More than 600 diesel road locomotives and about 500 diesel switching locomotives have been delivered to the network since 1981. On practically every road the TE3's have been partially or completely replaced by the 2TE10L, 2TE116, M62 and 2M62, and the 2TE10L in turn by the 2TE10V, 2TE10M, and 3TE10M. The updating of the park is continuing.

On the Belorussian, Moscow, Northern, Southwestern, West Siberian and other roads where good care has been taken of equipment and where they have been strengthening and developing a repair capability, all targets are being successfully fulfilled for shipment of freight and passengers. You cannot say that about the Gorkiy, Odessa, West Kazakhstan, Central Asian and Alma-Ata Railroads, on which the number of breakdowns and unscheduled locomotive repairs has increased.

What measures are being taken to improve the condition of the diesel locomotive park as a whole aside from replenishing it with new locomotives? First, the plant and equipment of depots are being strengthened and expanded. In the current 5-year period 26 shops will be built for TR-3 minor repair of diesel locomotives, 41 shops will be built or undergo reconstruction for TR-1 minor repairs and TO-3 technical maintenance, and technical maintenance buildings have been assembled from lightweight metal fabrications at 133 points. Second, personnel of the depot have undertaken conversion to the flow-line method of repairing locomotives. This will make it possible to raise the labor productivity of workers and to prepare the equipment better for operation....

[Question] Speaking about the qualitative changes in the network's park of diesel locomotives, we would like to turn attention to their operation. Last year more than 80 new diesel locomotives were sent to the Alma-Ata Railroad, more than 50 to the Gorkiy over the last 1.5 years, but the condition of their park in operation has not improved, and the number of machines out of repair has even increased. How do you explain this situation?

[Answer] As a matter of fact, there recently has been a substantial updating of the park of diesel locomotives of the Alma-Ata and Gorkiy Railroads. We anticipated improvement of operating performance. A check showed that everything has turned out differently.

Over the last 1.5 years speed, average daily productivity and the run of diesel locomotives in freight traffic have dropped on the Alma-Ata Railroad. Three-section locomotives are often being used unjustifiably on sections with gentle grades.

The downtime of diesel locomotives in all types of repairs and servicing has increased considerably on the road. Some 140 sections went through TR-3 minor repairs, not including work to improve the conditions of the crew quarters, and they have been operating with excessive runs before servicing. Last year on the Alma-Ata about 6,000 wheel-motor units were damaged.

The situation is hardly any better on the Gorkiy. This year 25-26 locomotives have been going in for unscheduled repairs every day. A large number of TEP60 locomotives are in disrepair. The requirements of the system of preventive maintenance and servicing of diesel locomotives are constantly being departed from on the road. About a third of them are operating with an excessively long run before the TR-1 minor repairs, 17 percent before the TR-2, and 18 percent before the TR-3. The downtime of machines during repairs exceeds between twofold and threefold the average allowances for the network at the Yudino, Agryz, Murom and Kanash depots.

How is one to explain the unsatisfactory condition of the diesel locomotive park on the Alma-Ata and Gorkiy Railroads? Above all by the oversights of locomotive services and depot management in organizing operation and repair of the machines, the lack of initiative on the part of senior officials of the roads and the locomotive services in such important production matters as development of plant and equipment, improvement of repair technology, creation of good working conditions in the depots, and improvement of personnel qualifications.

The same can be said of the Kuybyshev and Odessa Railroads.

[Question] We have had occasion to hear in several depots, specifically in the Osnova depot, complaints that their diesel locomotives are being operated carelessly and are even being withdrawn from service on the sections of other roads. This is also confirmed by letters received by GUDOK.

[Answer] We also have evidence that the locomotives of "others" being operated on sections designated by MPS [Ministry of Railways] served by the two railroads are often withdrawn from service. Moreover, they are not sent to their home depots for a long time. For example, this is how the diesel locomotives are being treated by the Povorino depot on the Southeastern Railroad in the section between Povorino and M. Gorkiy in the Volgograd Department of the Volga Railroad. Breakdowns of locomotives of "others" are occurring even on the Moscow, the Belorussian, the Southeastern and the Baltic Railroads.

The question is whether we, locomotive management personnel, should divide diesel locomotives into "our own" and "others"? They are all ours, we must handle them thriftily, taking the viewpoint of the state.

The personnel of certain depots take a careless attitude not only toward equipment of "others," but even towards their own: they do not abide by periods for the length of runs between overhauls, they even allow locomotives in disrepair to go on the road in order to fulfill the target for the number of diesel locomotives in service. In three of four cases locomotives are damaged on well-known sections. This is evident that on the road locomotive crews are not performing their duties conscientiously.

Unless we show an elementary feeling of responsibility for the equipment entrusted to us, then even the best designed locomotive will not serve reliably or a long time.

[Question] In recent orders of the MPS, specifically Order No 10Ts, recommendations of schools of advanced know-how at the depots at Solvychegodsk, Zhmerinka, Gomel, Poltava, Sarepta and elsewhere, mention is made of strict fulfillment of plans for preventive maintenance of equipment. But they can be successfully performed only provided there is improvement of the organization and technology for repairing the diesel locomotives....

[Answer] Yes, that is so. You have surely seen such a situation in a depot yourself: the collective is expending all its energies not to fulfill the plan for preventive maintenance, but in order to return locomotives on the

line that have come in for unscheduled repairs. It has been established that two-thirds of locomotive breakdowns result from tardy or poor performance of technical servicing and repair.

There is one way out of this situation--to introduce progressive flow-line methods of repair and to mechanize and automate laborious processes in depots. The know-how of the progressive collectives of depots at Solvychegodsk, Zhmerinka, Uzlovaya, Ashkhabad and others shows that only by these methods alone it is possible to reduce to a fraction the idle time of locomotives during repairs and to sharply improve the quality of repairs.

A question arises in connection with the transition to the flow-line method: And where is one to get attachments, stands, and mechanization equipment? Back in 1979 the MPS required every road in Order No 30Ts to set up an experimental facility for manufacturing them. The Dnepr and Northern Railroads were among the first to open such facilities. As a result the depots of those main lines, performing major repairs, have been almost completely furnished with mechanization equipment and attachments. That is what the others should do as well.

I would like to speak about the widespread use on the roads of the network of such progressive methods of repair as washing out water systems with linguosulfonic acid, checking the pistons of the Model D100 diesel with an eddy-current detectoscope, seeking the leakage of gases into the water system by means of ultrasonics, restoring alkaline storage batteries, and so on. Last year the collectives of depots manufactured about 1 million assemblies and parts and rebuilt more than 300,000 assemblies and parts by improving the operating procedures of repair personnel....

[Question] Yet still the shortage of spare parts is being acutely felt. In the Sarepta depot, for example, machinists who work on diesel engines wait 2 or 3 days for component parts. At the same time we know that at the Yudino depot traction motors were stored in a heap outdoors....

[Answer] Not only electric motors. Inspections have shown that again in Yudino about 1,000 sets of new bronze motor-axle bearings and boxes containing imported equipment were stored in a disorderly. At the depot at Murom hundreds of bushings of connecting rod bearings, piston rings for D100 diesels, electric brushes, and electromagnetic coils have been spoiled because of corrosion. Those responsible were called to account for this attitude toward spare parts.

It is evidently worthwhile to speak about the fact that by no means all locomotive personnel are aware of how responsible they are for the storage of spare parts and for their use. The weight of the burden now carried by MPS plants, which manufacture 50 percent of all spare parts for us--over and above their principal work, the repair of rolling stock, is not difficult to imagine.

Still I would like to know that MPS plants are not producing enough cylinder sleeves, turbocompressor parts, reducers, air pumps and compressors. Often

this is the reason why locomotives stand idle for a long time undergoing repairs....

[Question] We must assume that the project begun by MPS plants to fully modernize the TE3 and 2TE10L locomotives, which are the basis of the network's park of diesel locomotives, will also increase its overall reliability in operation. GUDOK readers are asking in their letters how operation of the modernized locomotives will be organized....

[Answer] It is still early to speak about the results of the work on full modernization, it only began last year. We anticipate that by improving the design of the old machines their length of service will come close to that of the new ones. This year the plan calls for comprehensive modernization of 200 2TE10L sections and the same number of TE3's at MPS plants. These diesel locomotives must be concentrated in the same depots. In the process of repair assemblies and units need to be put in their proper place and not scattered over other locomotives. Otherwise the benefit from modernization will go for naught.

[Question] Nearly one-fourth of the entire group of railroad personnel work in locomotive management, and a sizable portion of fixed productive capital is concentrated there. Thus it can be said without exaggeration that the fate of traffic depends in large part on the smooth operations of the personnel of locomotive depots. Yevgeniy Gregor'yevich, how would you state the main production problem for the personnel of depots in the stage of preparing the country's work collectives for the upcoming national holiday--the 60th Anniversary of Formation of the USSR?

[Answer] The personnel of locomotive depots need first of all to aim their efforts at fulfilling the plan for restoring locomotives and staying within allowances for the idle time of diesel locomotives in repairs. This is demanded by the situation that has come about. Just look how the network's park of diesel locomotives was used in September: the average productivity and average run of locomotives--I emphasize, in a particularly strenuous period of freight traffic--turned out to be lower not only than the figures planned but also lower than last year's indicators for the same month.

The personnel of depots need to vigorously apply to production the advanced know-how in organizing the work of repair personnel and locomotive crews, to develop the comprehensive system of repair quality control, and to constantly raise labor productivity. And, of course, they must not forget improvement of people's working conditions and rest and recreation.

7045
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RAILROAD

SPECIAL EQUIPMENT USED IN BAM CONSTRUCTION

Moscow STROITEL' NYYE I DORUZHNNYE MASHINY in Russian No 8, 1982 pp 19-20

[Article by Candidate of Technical Sciences V. G. Tayts and engineers I. A. Berkut and V. V. Tayts, Bamstroymekanizatsiya [BAM Construction Mechanization Trust]: "Reliability, Operation, Technical Servicing and Repair of Machines--Ways to Increase the Effectiveness of BAM construction"]

[Text] Construction of the Baykal Amur Mainline [BAM] is being carried out in harsh climatic and natural conditions. The over-all length of the BAM route is 3,122 kilometers and the greater part of this is located in territory which GOST 15150-69 has consigned to regions of cold climate.

The extreme conditions for the construction have generated the need to employ in the BAM construction equipment of the "KhL" make, which can maintain high productivity in temperatures below -40 degrees Celsius.

The foundation of the inventory of excavating machines consists of domestic excavators with a shovel capacity of 0.65-2.5 cubic meters. Of these only 19.6 percent are manufactured as "KhL" type and are also excavators produced by foreign firms.

The inventory of bulldozers consists of high-powered machines of both domestic and foreign manufacture.

The machines of domestic "KhL" make and the imported machines which operate on the BAM have a number of design characteristics which permit effective use of them under the conditions of a cold climate. They are equipped with hermetically warmed cabins with radiators or individual heaters. The motors of these machines are equipped with electric heating and have devices for facilitating starting in low temperatures through the use of ether and glow spark plugs. The metal structures of the machines employ low-alloy steel which has higher indicators of cold brittleness and impact and fatigue strength.

The BAM construction project has become a unique testing area in which checks are carried out on the efficiency of the construction and road machines of various makes manufactured by domestic industry and foreign firms. A great deal of work in this direction is being done by the TsNIIS [All-Union

Scientific Research Institute of Transportation Construction], the Tynda frost station, and the Krasnoyarsk affiliate of the VNIistroydormash [All-Union Scientific Research Institute of Construction and Road Machinery]. On the BAM there have been set up and are now functioning support points of the Voronezh production association for the manufacture of excavators, the Kostroma Order of Labor Red Banner excavator plant Rabochiy Metallist, the Chelyabinsk Order of Lenin road machinery plant imeni Kolyushchenko, and others. In cooperation with the trusts and industry institutes, these organizations bring to light the various design deficiencies and make recommendations for improving the design of the construction and road machines. On the basis of the work done in 1980 there were developed and approved by the ministries of construction, road and communal machine-building measures for providing technical assistance for the BAM organizations. In particular, these measures provided for the accomplishment by the Minstroydormash [Ministry of Road Machine-Building] of repair of the hydro-equipment for the construction and road machines and the maintenance at the support points of the requisite supply of reserve sets of spare parts and exchange stocks of hydraulic drive units. The Glavbamstroy [Main Administration for BAM Construction] assigned specialists to the plants which manufacture machines with hydraulic drive and hydraulic drive components to study the characteristics of the design, manufacture and operation of the machines and equipment.

A serious problem for the BAM construction personnel is the organization and accomplishment of technical servicing (TO) and repair of the construction equipment, which on the BAM has a labor intensiveness and cost 1.5-2 times greater than in the European part of the country and a 20-25 percent longer time cycle. Up to 80 percent of the TO work and 20 percent of the work of repairing the machines is done at the place of their operation. A number of measures were worked out for the introduction of the method of centralized technical servicing (T_g TO). Chief among these measures are the following: improvement of the design of the mobile facilities for servicing the machines and strengthening the material and technical base; the formation of specialized brigades for servicing specific groups of machines; the establishment of a system of wages for fitters which will provide an incentive for maintaining the equipment in good working condition and help to hold the personnel in their jobs.

Together with the BAMstroymekhanizatsiya and the Leningrad road machinery plant of the motor road construction and operation ministry of RSFSR, the Tynda frost station set up new mobile motor vehicle workshops on the chassis of KrAZ-255B, ZIL-131 and ZIL-130G motor vehicles, equipped with highly productive technological equipment and a rotary hydraulic freight hoisting device. The introduction of these has enabled us to improve the quality of the TO and repair of the machines, to increase the labor expertise of the service personnel, to mechanize the dismantling and assembly operations and reduce their labor intensiveness by 25-30 percent, and to free the specialized motor vehicle cranes which were previously used for the accomplishment of this work.

An important problem is making provisions for protecting the equipment and service personnel from the adverse effect of low temperature in the

performance of TO of the construction and roadmachines in field conditions. As it is, only 20 percent of the construction organizations which work in the BAM region have been provided with stationary quarters for the accomplishment of TO and repair of the construction and road machines.

The BAM has acquired some experience in using tents and tent structures to cover the equipment. The solution of this problem is in many respects dependent on the availability of easily assembled and dismantled tent frame accommodations equipped with hoisting devices and heating facilities. In line with the technical assignment, the TsNIIS and the PKB [planning and design office] of Glavstroymekhanizatsiya, the Mintransstroy [Ministry of Transport Construction] fulfilled in 1980 the work plan for easily assembled accommodations of the hangar type with a 3.2-ton hoisting capacity hydraulic crane, the manufacture of which was planned for 1982.

Reduction of the duration and labor intensiveness of the TO and repair of the machines is also being achieved through the use of diagnostic means of determining the actual technical condition of the units and assemblies and planning on this basis the volumes and times of the TO and repair. The TsNIIS and the Tynda frost station developed and in 1980 introduced in the BAMstroymekhanizatsiya and in the Mostostroy [Rayon Administration for Bridge Construction]-10 systems for diagnostic and prognostic analysis of the residual supply of construction materials by the method of control inspections and spectral analysis of the oils and pressure fluids for the depletion and mixture products. These systems provide for the maintenance of regular control and records of the effectiveness of the use of the construction and road machines and their TO and repair; the purpose is to evaluate the reliability and increase the effectiveness of the use of the equipment.

To accomplish this work we have organized special laboratories which contain an MFS-3 small-size photoelectric spectroscope and a set of equipment for chemical analysis of the fuel and lubricant materials.

In operation on the BAM are the KI-4270 and KI-13905 mobile diagnostic facilities based on the UAZ-452 motor vehicles which are manufactured by the Tarty experimental repair plant of the Estsel'khoztekhnika [Estonian Agricultural Equipment Trust]. The imported high-powered TD-25C, D-9H, D35-A-1, D 155 and others are delivered with a set of instruments, devices and tools for the purpose of accomplishing the control and diagnostic operations and checking the technical condition and other factors.

The first results of use of technical diagnosis of the construction machines by the methods of spectral analysis and control inspections conducted in the trusts of BAMstroymekhanizatsiya and the Mostostroy [Rayon Administration for Bridge Construction]-10 showed the superior effectiveness of this approach. More than 100 diagnostic warnings were received, which in most cases enabled us to avert breakdown repairs of the machines.

More widespread introduction of the methods of diagnostic analysis requires increasing the number of diagnostic installations, a step which will enable us to step up the level of the information on the construction and road

machines adaptable to control and to improve the accounting procedures in respect to the materials and spare parts in use.

A complex problem is entailed in the organization of repair of imported machines. This involves the use of a special type of rolled metal and materials as well as a special technology for the manufacture of the parts and assemblies, a technology which differs from the domestic system of linear dimensions and tolerances.

At the same time, a number of design features of the construction machines ease the task of repairing them in our plants. Thus, for example the 8DC 60C motor installed in the ND1500 excavator of the firm KATO can be replaced by the domestic YaMZ-23811B. The trusts BAMstroymekhanizatsiya and ZapBAMstroymekhanizatsiya [Western BAM Construction Mechanization] adapted more than 15 ND 1500 excavators of the firm KATO for operation with YaMZ 238 motors, which endows the machine with the necessary efficiency. In the operation of the imported machines there has been widespread replacement of the imported storage batteries with domestic ones in addition to the bearings, the oil and air pressure gages, the ampere meters, the motor thermometers, and the hydraulic drive, headlights and switches.

An urgent problem is manufacture of domestic bits for the excavator shovels and bulldozer rippers to replace the imported ones. In 1977 the Kiev Order of Labor Red Banner Construction Engineering Institute and the Institute of Casting Problems of the AN [Academy of Sciences] UkrSSR worked out a technology for the manufacture of bits for the lugs of excavator shovels and for rippers made from the new high-manganese, wear resisting steel; but series production of these has still not been started up.

The building up of caterpillar treads and rollers on the BAM was at first carried out with imported welding wire with a neutral fusing agent. At present, with the restoration of the undercarriage parts we are using the domestic welding materials recommended by the Electric Welding Institute imeni O. Ye. Paton.

The use of domestic assemblies and materials in the repair of imported machines enables us to cut down the need for imported spare parts and to reduce the expenditures of currency for the purchase of the machines and their downtime waiting for repair.

To increase the effectiveness of the use of construction equipment in the BAM zone and similar regions the following measures are needed:

Forbid the deliveries of equipment of the conventional type to regions which have to cope with a cold climate;

Expand the products list and increase the production of construction and road-machines of the "KhL" type, step up the requirements for the quality, reliability and durability of these machines, and increase the delivery of spare parts for them;

In providing components for the machinery park of the construction subdivisions obtain unification of the construction and road machines;

Increase the degree of repair adaptability of the construction and road machines of the "KhL" type and their adaptability for T0 under the conditions of low temperatures;

In the design of the machines make provision for built-in sensors and devices as well as easily accessible control points for facilitating diagnostic analysis;

Develop and begin manufacture of assembled and collapsible easily installed-- accommodations for equipment T0 and repair, equipped with freight hoisting devices and heating facilities;

Develop and organize in the industrial plants production of mobile motor vehicle workshops for technical servicing of the construction and road machines of increased unit capacity and equipped with hydraulic freight hoisting devices; also, the production of specialized facilities for the performance of technical diagnostic analysis at the place of operation of these machines;

Accelerate the scientific research work in respect to diagnostic analysis of the construction and road machines for the purpose of setting up new, effective facilities, working out a technology for diagnostic analysis, and introducing it in the operational work.

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RAILROAD

NEW WHOLESALE PRICES FOR RAILROAD CONSTRUCTION MATERIALS

Moscow PUT' I PUTEVOYE KHOZYAYSTVO in Russian No 9, Sep 82 pp 23-24

[Article by B. I. Shar, chief specialist at the institute Giprotransput' [not further identified]]

[Text] Wholesale prices and rate schedules put in effect in 1967-1971 have ceased to reflect the changes that have been taking place in industry and in the location of the country's productive forces, and they have also ceased to correspond to the present-day conditions for production and sale of products. In recent years the production of fuel and raw materials has increased in the northern and eastern regions, and in the regions already developed it has become more difficult to obtain these resources. Wages have risen. All of this has brought about higher costs in a number of sectors, especially the fuel and raw materials sector.

Wholesale prices and rate schedules in the national economy have been revised in order to strengthen the economic stimulation of scientific-technical progress, stricter conservation of fuel and energy resources, ferrous and nonferrous metals, raw materials and supplies, and improvement of product quality.

New wholesale prices were introduced in 1982 on impregnated wood (Price List No 07-05), ballast materials for railroad roadbed, welding, metal deposition and grinding work, manufacture of track parts (No 06-12-16), restoration of used ties at impregnation plants (No 26-01-16, Part 1), track tools (No 29-01-16), and thermal energy released for productive purposes (Price List No 09-02-16).

Impregnated Wood

The prices of impregnated timber in the new price list, just as in the old one, are differentiated by five geographic zones. But the scale of the zonal division has been brought into conformity with Price List No 07-03 "Wholesale Prices of Timber," because the wood accounts for 80 percent of the value of impregnated timber, and the other costs for the plants (zones) hardly differ at all. One and the same prices have been adopted for ties and bridge and crossover timbers in Zones I and II because their costs are close to one another. In order to facilitate settlements with customers at the plants, supplements to the wholesale prices have been replaced by wholesale prices worked

out for hardwood timber. Prices for subway ties have been included in the price list.

The conditions for impregnation and the rate of consumption of the antiseptic differ depending on the species of wood. That is why wholesale prices for impregnation of timber belonging to the customer (not including the cost of the raw material) have been set for species of wood. Rate schedules were omitted for binding, drilling, and stamping ties at tie impregnation plants, since that is not done there.

Timber is impregnated at enterprises of MPS [Ministry of Railways], USSR Minenergo [Ministry of Power and Electrification] and USSR Minsvyazi [Ministry of Communications]. The rate of profitability relative to productive capital has been set at 12 percent. Profitability represents 5.5 percent of production cost. The rates of profitability relative to production cost have been adopted for the following product groups: 4 percent for ties and timbers for switch crossovers; 10 percent for bridge timbers, round timber for communication lines, power transmission lines and the automatic block signal system, cross arms, and impregnation of the customer's timber.

<u>Product Designation</u>	<u>Old Price, in rubles, kopecks</u>	<u>New Price, in rubles, kopecks</u>	<u>Increase, %</u>
Broad-gauge railroad ties, Type I, per piece	6-05	8-95	47.9
Bridge timbers for broad-gauge railroads, per cubic meter	87-00	140-00	60.9
Timbers for switch crossovers on Al broad-gauge railroads, Type I, per set	1,595-00	2,825-00	77.1
Round timbers 7.5 and 8.5 me- ters long, 14-24 centimeters in diameter, per cubic meter	37-40	53-40	42.8

The new wholesale prices have taken into account price increases of timber: 51.3 percent for ties, 89 percent for crossover timbers, 36 percent for poles used on communications and power lines, 40 percent for anthracite and bitumi-nous creosote oil, 20 percent for shale oil, and prices and rate schedules have also been changed on fuel, electric power and heat. Introduction of pro-duction processes for impregnating wood, which were introduced in January 1982, raised wholesale prices by 5.3 million rubles, or 2.5 percent. But the saving from extending the service life of ties covers the increased cost of impregnation.

The 1979 introduction of regional coefficients applied to wages on 10 rail-roads, awards for length of service, and the increased social insurance deduc-tions were also taken into account. The table shows how the prices of the principal softwood products (not including hardwood) have changed for Zone II.

In 1982 the profit from commodity output was 9.3 million rubles, and was up 2.9 million rubles, or 45.3 percent, by comparison with the profit accruing at

the previous prices. Thus the new wholesale prices will completely reimburse production costs and will motivate enterprises to increase the output of impregnated timber.

Ballast

Because of the closing of enterprises the new price list, No 06-12-16, does not include prices on natural stone ballast of sedimentary rocks on the Odessa Railroad, natural stone ballast from the boulder-gravel deposits on the Baltic, Belorussian, Transcaucasian and Central Asian Railroads, nor gravel-sand ballast on the Central Asian Main Rail Line. The Klesov Ballast Plant has been turned over to the Belorussian Railroad, and for that reason the wholesale price on natural stone ballast of igneous rock was omitted for the Lvov Railroad. Wholesale prices on the Lvov and North Caucasian Main Rail Lines have been transferred from the section entitled "Gravel Ballast" to the section entitled "Gravel-Sand Ballast." A number of prices were included for gravel and gravel-sand ballast obtained in quarries as part of subsidiary and auxiliary activity of the railroads. A section was included entitled "Shellrock for the Ballast Layer of the Railroad." Under Paragraph 7 of the General Instructions to the price list, timber used by gravel plants and quarries to reinforce the sides of flatcars (stakes and boarding) must be paid for by consumers of the product at the rate of 20 rubles per cubic meter. Average profitability was adopted at 20 percent. At the same time it varies from road to road from 14 (Southeastern and Volga) to 29 percent (West Siberian and Far Eastern). The gradation of wholesale prices of ballast has been retained depending on the rock and the size of the fractions. Differentiation by strength has been introduced.

An analysis is shown that at a number of enterprises planning and reporting pricing calculations on ballast materials are being incorrectly drawn up. The costs of stripping operations are written off out of proportion to the ballast quarried. A portion of the costs are not charged to future periods. The costs of maintaining and operating equipment and also plantwide costs are distributed among products arbitrarily rather than in line with the basic wage of the workers. Though the costs of loading the finished products and of delivering and cleaning the cars are the same, the nonproduction costs differ from product to product. There has to be strict enforcement of the instruction on planning, recording and calculating the costs of rock building materials adopted by the Ministry of Construction Materials Industry on 12 March 1971.

On the whole wholesale prices for ballast materials have risen 12.7 percent, including a 7.8 percent increase related to bringing profitability up to the standard level, 4 percent related to introduction of a regional supplement to the wage and for length of service, and 0.9 percent because of changes of prices of fuel and electric power and higher social insurance deductions.

Operation of RSP [Rail Welding Trains]

The price list on work done by RSP has omitted wholesale prices for deposition of metal in frogs with an assembled-rail core, pressure-gas welding of rails, repairing and welding rails by the thermit method, and prices for removing the

beveled edge from the bearing surface of the head of the rail (included in the prices of welding). The price list has included prices for repairing high-manganese frogs by machining them in the permanent facility, for welding new ones, for repairing and welding used hardened rails, the welding of lengths of rail for installation depending on the length of the rails, and for making new stock rails.

The average rate of profitability relative to production cost has been set at 29 percent. Wholesale prices of seam welding and grinding work have risen 8.8 percent: 3 percent to bring profitability up to the standard level; 4.1 percent because of introduction of the regional wage supplement on the railroads of the Urals, Siberia, Kazakhstan (Karaganda department), the Far East and to pay awards for length of service; and 1.7 percent because of price changes of supplies, fuel and electric power and the rise of social insurance deductions.

The following relationship existed in the previous wholesale prices for repairing and welding old rails: 95 percent for welding one end and 5 percent both ends. Yet about 40 percent of the rails were welded at both ends. This work was a losing operation at almost all enterprises, but excessive profit was earned in welding new rails. Now the prices of welding new rails have been reduced by an average of 7 percent. Wholesale prices for repairing and welding used rails have been raised: 24 percent at one end and 86 percent at both ends. The price of making bolted insulated joints has risen 64 percent. All this should motivate rail welding enterprises to increase the amount of welding and deposition of metal.

The Net Output Norm

Previously the performance of industrial enterprises was judged mainly by the volume of commodity, gross and marketed output in wholesale prices. The more expensive materials, components, electric power and fuel consumed, the more expensive the fixed productive capital (and, as a consequence, the higher the depreciation), the higher the wholesale price was set on the end product. The conditions of work collectives were not reflected at all in the price. In order to correct these shortcomings and to give enterprises greater motivation to intensify production and improve product quality, the "normative net output" indicator has been introduced. It is used to determine the growth rates of production and labor productivity, to plan the wage fund, to monitor its use, and so on. This standard includes the wage, social insurance deductions and profit. When this indicator is calculated, the base and supplemental wage of workers and also social insurance deductions are taken from official calculations of production costs.

The standards for impregnated timber are given in supplemental price list No 07-05-1980/1. They take into account the profit adopted in wholesale prices, and profitability has been set at 90 percent of wages of production personnel proper. The standards have been set uniformly for all geographic zones.

The relative share of net output norms in commodity output in wholesale prices is 5.9 percent for cross tie impregnating plants. Wages are equal to only 32 rubles per 1,000 rubles of output, and the norm is only 59 rubles. The reason for this is that the cost of the wood makes up the bulk of the wholesale prices.

The standards for ballast materials, welding and deposition of metal, and grinding work are given in price list No 06-12-16. Each type of product has been assigned its own standard. For ballast materials wages are 319 rubles and the standard 495 rubles per 1,000 rubles of output, and for welding, deposition of metal and grinding work the figures are 375 and 588 rubles, respectively. The net output norm ranges from 41.7 percent of the wholesale price (making bolted joints) to 76.1 percent (seam welding of high-manganese frogs on the track).

The net output norms for major overhaul of equipment done by the direct labor method are being worked out by industrial enterprises using estimated cost procedures and not including profit.

The new standards for output achieved on the basis of one-time orders and production services are also being worked out by the manufacturing enterprises themselves from the official calculation of production cost, cleared with the customer. The profit included in the standard is calculated on the basis of profitability in percentage of the production cost after deduction of raw materials, fuel, energy, supplies, intermediate products and components used as a whole in the current year according to the plan of the enterprise, but not less than 25 percent. The level of profitability is determined by dividing the sum total of profit according to the plan for the current year by the production cost after deduction of the value of raw materials and fuel and energy resources consumed.

The volume of normative net output is calculated from all the elements that make up industrial output. The makeup of these elements, just as in the case of commodity output, is determined in wholesale prices in accordance with the Standard Instruction for Compiling Reports of Industrial Enterprises on Fulfillment of the Plan for Output, No 4-102, approved by the USSR Central Statistical Administration on 11 May 1971.

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RAILROAD

TECHNOLOGICAL ADVANCES IN RAILROAD TRACK MANAGEMENT

Moscow PUT' I PUTEVOYE KHOZYAYSTVO in Russian No 9, Sep 82 pp 30-31

[Article by Yu. A. Ugodnikov, deputy department chief of PTKB [not further identified]: "From the Technologists to Production Personnel"]

[Text] In 1963 the technology department was created in the PTKB of the Main Track Administration of MPS [Ministry of Railways], and since that time it has developed and applied 415 production procedures. They have covered all the new organizational forms of work and track machines as well as all types of track building. The technologists are now paying principal attention to rail line maintenance and repair by machine. Such major work procedures have been devised and applied as "Performance of Comprehensive Scheduled Preventive Maintenance of Track and Crossovers," "Rules and Work Procedures in Replacement of Certain Metal Parts of 1,520-mm-Gauge Switch Crossovers," "Rules and Work Procedures for Current Track Maintenance Using VPR-1200, VPRS-500, R-2000 and PMG Machines in Operational Delays for Repairs of Varying Length."

On the Moscow and October Railroads a new machine system has been introduced for track maintenance using the VPR-1200, VPRS-500, R-2000 and PMG machines. It envisages improvement of the structural forms of track maintenance departments and organization and technology for current maintenance.

Recently the requirements have risen for the organization of track repairs. It has become of paramount importance to increase the speed of trains after the "delay period," reduction of the duration of cautions, introduction of progressive work procedures, and higher output during the period of delay for repairs.

A package of new work procedures was developed and introduced taking this into account. These are the "Track Repair During Combined Delay Periods, Including Development of Measures for Accelerated Train Traffic on the Neighboring Track," "Major Track Repairs on Different Types of Track Guaranteeing Safe Passage of Trains After the Delay: At a Speed of 25 Kilometers Per Hour in the First Two and 60 Kilometers Per Hour in Subsequent Runs," "Repair of Welded Track," "Track Repairs Using New Track Machines: The UK-25/9-18, the VPO-3000, the Track Straightening Machine, the ShchOM-4, ShchOM-DO, ShchOM-ZU and BMS," "Major Track Repairs Increasing Output in the Delay Period," and "Track Repairs Involving Lowering or Retention of Elevations of the Lengthwise Profile Using General-Purpose Construction Equipment."

Staff members of the department have devised work procedures in the field on the recommendation of a number of production innovators. They include "Replacement of Stock Rails by Lengths of Welded Track From a Rail Car, Proposed by Production Innovators of PMS-115 [track machine station] of the Belorussian Railroad," "Laying Track of Welded Rail Lengths of Measured Length Without Cutting Off the Ends According to the Recommendation of V. A. Kozlovskiy," "Major and Medium Track Repairs in a Combined Delay Period Using One and the Same Track Machines on the Recommendation of Production Innovators of the South Urals Railroad," "Major Repairs Using Two BMS Retaining Elevations of the Lengthwise Profile on the Recommendation of Production Innovators of the Dnepr Railroad."

Introduction of these processes saved many tens of millions of rubles.

Jointly with normative-instructor stations of the Main Track Administration and the scientific management laboratories of the railroads, the department developed and introduced 5,500 technically sound standard norms governing track maintenance and repair. Made up in the form of flowcharts with assigned standards, they have been collated into separate manuals by types of work and printed in large numbers.

Scientific associates of the department have summarized the experience of 153 enterprises and published 65 articles in the journal PUT' I PUTEVOYE KHOZYAYSTVO, in information collections of TsNIITEI [Central Scientific Research Institute of Information and Technical and Economic Research] of the MPS and in separate issues of the "Transport" Publishing House.

Advanced know-how has been summarized and disseminated concerning the organization and work procedures of track maintenance and repair, scientific organization of work and health and safety standards, the organization of socialist competition, economics education and work norm setting, creativity of innovators in organizational efficiency, and adoption of esthetic standards in production.

The department has participated in the drafting of 112 regulations and instructions, normative documents, methods recommendations, standard designs, and so on. The main ones are these: "Rules for Safety and Industrial Hygiene in Performance of Operations in Track Management," "Instruction on Maintaining Safety of Train Movement When Track Work Is Being Done," "Safety Measures in Care for Protective Tree Belts Along the Railroads" (posters), "List of Principal Occupations of Track Management Personnel in Railroad Transportation, Their Wage Classifications and Pay Conditions," "Standard Instructions on Work Health and Safety of a Number of Worker Categories," "Instruction for Track Work-Team Leader," etc.

During the 11th Five-Year Plan we face the task of substantiating the most optimum system for current track maintenance by machine and by extending aid to track maintenance departments in its application.

In the near future new work procedures will be created and existing ones corrected concerning current track maintenance so as to take into account maximum

use of machines to mechanize laborious operations. Provision has been made for devising an interrelated set of work procedures for track repairs using new machines and machinery whose use reduces labor intensiveness, improves the quality of work, increases output during the delay period, and shortens the time cautions are in effect. PMS will be extended assistance in introducing them.

The department will continue in future to actively summarize the know-how of progressive collectives, to promote application of that know-how in all track enterprises, and to draft recommendations for reuse of used track materials.

Plans call for compiling standard labor inputs in maintenance of 1 km of protective forest belts for varying climatic conditions, standards of technological work intensiveness per unit of work done in machine shops of track maintenance departments, PMS and track road workshops in repairing and making track machines and machinery.

Plans call for continuing the introduction of the following tasks of the subsystem of the ASU Put' [computerized system for track management] on the railroads:

- i. information reference system on the state of the track;
- ii. determination of the necessary annual volume of track repair from standard time intervals and distribution of amounts of major repairs in accordance with allocated limits;
- iii. day-to-day monitoring of initiation and termination of cautions;
- iv. monitoring correction of irregularities on kilometers which have been given an unfavorable assessment.

An important place will also be given to drafting sectorwide standards for percussive track tools and safety techniques and industrial hygiene in the performance of track operations.

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RAILROAD

PREPARATION FOR USE OF EIGHT-AXLE RAILROAD CARS

Moscow ZHELEZNODOROZHNYY TRANSPORT in Russian No 9, 1982 pp 77-78

[Text] In order to expand the use and improve the efficiency of 8-axle gondola and tank cars with 1-T outside dimensions, and also for the purpose of introducing 8-axle gondola cars of T_{pr} size and tank cars of T_{ts} size, an interrelated group of measures has been outlined for appropriate preparation of the rail network for use of this rolling stock, and they have been set forth in Order No 22Ts of the Ministry of Railways.

The order first pointed out the need to work out with other ministries calendar plans in 1982 for the production and delivery of large-capacity 8-axle cars to railroad transportation and to concentrate all existing size 1-T 8-axle gondola cars and tank cars and those to be delivered on the routes of fuel shipments indicated in the order. Those routes have been assigned specific dates for performance of work to prepare for introduction into service of size T_{pr} 8-axle gondola cars and size T_{ts} tank cars with a load per meter of 9.5 tons.

The railroads and regional industrial railroad transportation associations have been issued a recommendation that on the basis of results of a survey of the clearance and technical condition of railroad structures and devices they work out plans for preparation for use of the 8-axle cars, using the relevant sources of financing for that purpose.

Project planning and surveying and construction and installation work is to be done during the preparations to eliminate places with inadequate clearance on bridges, platforms, semaphores, spacing between main tracks, supports and other structures, to strengthen the roadbed and above all to stabilize the base area and improve the strength of embankments and also to replace and strengthen bridge spans with insufficient carrying capacity, in order to allow unhindered traffic of general-purpose gondola cars and tank cars with a load per meter of 9.5 tons. In the more remote future plans call for preparing man-made structures to allow passage of specialized gondola cars with a load per meter of 10.3 tons. On a number of roads, specifically the Far Eastern, the Transbaykal, the Krasnoyarsk, the West Siberia, the Transcaucasus and the Dnepr, in the 11th Five-Year Plan and subsequent years major project planning and construction work will be done on reconstruction of small-clearance tunnels to allow passage of the larger T_{pr} and T_{ts} cars.

On behalf of successful performance of these measures the order has provided for increasing the technical capability and strengthening the production facilities of the construction organizations of the railroads, enlargement of deliveries of specialized tools, earth-moving equipment and motor transport equipment, and, in particular, truck cranes with a load capacity of 120 tons to perform operations in replacement and repair of span structures of bridges and to strengthen the roadbed. The specialized tools reaching railroads will in turn be allocated to bridge organizations replacing or reinforcing the span structures of bridges built to the old design standards.

A number of measures are to be performed according to plans at the network's stations in order to ensure performance of operations with the Tpr 8-axle cars. The appropriate changes are to be made in the station documents used for issuing technical orders, a minimum list is to be drawn up of narrow-clearance intertrack space to be widened to allow the passage and handling of the planned flows of rolling stock, and stations are to be appropriately reorganized within the assigned periods of time.

Particular attention has been paid to stations at which large projects are to be carried out involving preparation of specific designs for broadening the space between tracks. Those designs must be prepared on orders from the railroads by the Main Administration for Designing Railroad Transportation Structures before 1985.

The Dnepropetrovsk Railroad Transportation Engineers Institute, the All-Union Scientific Research Railroad Transportation Institute, the Main Administration for Signaling and Communications, and the Main Traffic Administration have been ordered to study the operating conditions for braking equipment and other external devices at stations and to issue in 1982 documented recommendations for comprehensive preparation of hump yards to handle the 8-axle cars with an axle load of 22 tons and also to draft recommendations for braking the 8-axle cars in small-capacity hump yards. It is indispensable that the Main Administration for Industrial Railroad Transportation and the Main Freight Administration draft recommendations for submittal to USSR Gosplan and USSR Gosnab on procedure for purposive distribution of car tippers so as to take into account the sequence of stages envisaged in the order for introduction of the 8-axle gondola cars on the network.

In order to ensure reliable operation and prompt and competent repairs and technical servicing of size 1-T rolling stock the Main Car Management Administration must complete in the 1982-1983 period the appropriate preparation of the car depots enumerated in the order and also car preparation points located on the routes for fuel shipments. At the same time it is necessary to draft and fulfill on schedule a plan for preparation of car depots and their operational subdivisions for introduction of the 8-axle gondola cars and tank cars of the larger sizes T_{pr} and T_{ts}. In addition technical specifications for car repair machines and nonstandard equipment should be corrected in 1982 so as to take into account their use in repairing the 8-axle cars and should be submitted to the Main Administration for Repair of Rolling Stock and Production of Spare Parts. When project plans for the 8-axle cars are being agreed on, it is recommended that particular attention be paid to guaranteeing their

repairability. The Main Administration for Repair of Rolling Stock and Production of Spare Parts, in conformity with Order No 22Ts, is required in future to see that car repair plants are prepared for repairing 3,000-4,000 8-axle gondola and tank cars, including those of the larger size, and to provide for subsequent enlargement of capacities of plants for repairing this rolling stock. Beginning in 1984 the main administration must begin to deliver non-standard equipment and car repairing machines to the railroads according to plans cleared with the Main Car Management Administration.

It is an important task to prepare sidings for operation of the 8-axle cars. Examination of sidings by commissions is accordingly provided for on the railroads, and the necessary requirements are to be submitted to their owners on the conduct of preparatory work. During the regular revision of agreements for operation of sidings of industrial enterprises and uniform operating procedures it should be strictly stipulated that work be done to strengthen pieces of equipment intended for receiving, passing and handling the large-capacity 8-axle cars.

The order requires that when main administrations, railroads and regional industrial railroad transportation associations are planning and carrying out projects for new construction, reconstruction and strengthening and repair of railroad transportation facilities, they make provision for performing them in accordance with the standards set by the State Standard for Clearances of Structures and Railroad Rolling Stock. In order to enhance the role of clearance-survey stations in improving the condition of the railroads as to clearance the order points out the need for examination and adoption of a regulation concerning those stations and also for enhancing the responsibility of chief engineers of railroads and chiefs of track services for ensuring the normal operation of those stations.

In order to coordinate monitoring progress in preparation of the network for use of the larger cars Order No 22Ts provides for creation of a specific commission and also annual reporting of the railroads and regional industrial railroad transportation associations on performance of the scheduled work. The All-Union Scientific Research Institute of Railroad Transportation and the State Institute for Technical-and-Economic Surveys and Project Planning of Railroad Transportation have been ordered to extend aid to the railroads as to methods in solving problems that arise in the process of preparing the network for introduction into service of the larger-size 8-axle cars.

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RAILROAD

BRIEFS

MORE CONCERN FOR BAM BUILDERS--Yesterday in the AUCCTU Palace of Labor a conference was held which examined the question of the participation by trade-union organizations in improving the commercial, daily-life, cultural, and medical services to the workers employed in building the BAM. Taking part in the work of this conference were the leading officials of the Central Committees of the sectorial trade unions, ministries, departments, councils of trade unions and road-building organizations located in the BAM zone. The speakers emphasized that, in carrying out the decisions of the 26th CPSU Congress, the builders of the mainline must attain high production levels during the current five-year plan. Reaching a broad scope among the builders' groups is the competition to accomplish the tasks ahead of schedule in honor of the 60th anniversary of the formation of the USSR. The conference participants noted that the construction of housing and facilities for social, cultural, and daily life are lagging behind the needs. There should be a more equitable development of the network of enterprises engaged in commerce and public dining, everyday services, health care, and culture. The attention of the Central Committees of the trade union of railroad-transport and transport-construction workers, the councils of Irkutsk, Chita, Amur Oblasts, Buryat ASSR, Khabarovsk Kray, Yakutia, and road-building organizations was directed to the need for closer ties between the sectorial and territorial trade-union organizations and the economic organs, intensified monitoring of the development and implementation of plans for housing and everyday-facility construction. V. I. Prokhorov, deputy chairman of the AUCCTU, delivered a speech at the conference. Also participating in the conference's work was L. A. Zemlyannikova, secretary of the AUCCTU. /Text/ Moscow TRUD in Russian 29 Sep 82 p 1/ 2384

ORDER OF BAM WORKERS FULFILLED--For almost 10 years the Voronezh Bridge Structural-Component Plant has been making bridges for the BAM. During this period the bridge builders have shipped off about 400 span structures to various sections of the mainline. The Voronezh people have worked with success likewise during the year of the 60th anniversary of the formation of the USSR. In addition to the plan, since the beginning of the year they have made structural components worth a quarter of a million rubles. During this period the bridge builders completed with honor a regular term order of the BAM people--a five-span bridge for the 650th kilometer of the railroad's Western Section. In the final assembly of the span structures the mixed brigade of the Communist M. Kudoyavtsev distinguished itself particularly. /Text/ Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 2 Oct 82 p 1/ 2384

HYDROLOGISTS FOR BAM--/Regional specialists, scientists of the State Hydrological Institute have helped to cover a possible water-supply shortage in cities of the BAM zone./ */in italics/*. Yesterday they completed drawing up recommendations for the rational utilization of newly research underground sources. "Operations have been conducted in the Tyndy region. The population growth and intensive construction already requires an increase in the water supply here in the very near future," stated the scientific director of operations, Candidate of Technical Sciences B. M. Dobroumov. "The geologists have handed over to us the data concerning sites which have good prospects for development. Observations on the outlet flow, a determination of the water reserves, and data on outlays have allowed us to discover the optimum regime for its consumption." In the very near future the documentation will be handed over to the production workers, beginning to assimilate the region's water supplies. The research data will form the basis of designs for new, water-collecting structures. */Text/* */Leningrad LENINGRADSKAYA PRAVDA in Russian 15 Oct 82/* 2384

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OCEAN AND RIVER

GUZHENKO'S COMMENTS ON PORT FACILITIES, FOOD PROGRAM

Moscow EKONOMICHESKAYA GAZETA in Russian No 44, Oct 82 p 2

/Interview with USSR Minister of the Maritime Fleet T. B. Guzhenko by EKONOMICHESKAYA GAZETA: "The Sailors' Work Duties"; date and place not specified/

/Text/ [Question] Timofey Borisovich, how are sailors celebrating the 60th anniversary of the formation of the Soviet state?

/Answer/ In all the ships' crews and enterprises' groups a socialist competition has developed for a worthy celebration of this glorious jubilee. The merchant and passenger fleets of our mighty maritime power now have access to every corner of the world's oceans. The sailors strive to accomplish every trip with the maximum effectiveness for the national economy. The principal gift which we are preparing for the glorious date will be the fulfillment, ahead of schedule, of the plan for the first two years of the five-year plan.

The operational results of the steamship companies for the first three quarters of 1982 testify to the fact that most of them are successful in fulfilling their socialist pledges in honor of this noteworthy date. Throughout the ministry as a whole, the nine-month plan has been fulfilled for cabotage hauls by 103.1 percent and for overseas shipping--by 102.4 percent. Operations in October, despite the unfavorable weather conditions, furnish grounds for confidence that the year plan will be fulfilled by us with regard to the basic indicators ahead of schedule. The workers in this sector are handling with honor the pledges which they made for 1982 in honor of the 60th anniversary of the formation of the USSR.

Fine successes have been achieved by the groups of the Baltic Steamship Company, the port of Novorossiysk, crews of the diesel ships Vladimir Il'ich, Elektrostal', Nikolay Cherkasov, and others. One of our largest steamship companies--the Black Sea Steamship Company--this year is successfully coping with the fulfillment of the plan and its own pledges. Over the nine-month period its indicators are higher than those of its traditional partner in competition--the Baltic Steamship Company. Also over-fulfilling the plan and its own pledges is one of the youngest and most important facilities for loading and unloading /cargo-handling/ operations--the port of Il'ichevsk.

At the same time, the Murmansk Steamship Company, a number of ships and shoreline enterprises have permitted certain lags to occur. At the end of the second year of the five-year plan the Ministry of the Maritime Fleet, party, trade-union and

Komsomol organizations have taken measures to ensure that there be no laggards in this sector.

[Question] What contribution are sailors making to the implementation of the food plan?

[Answer] Maritime transport plays a particularly important role in delivering foodstuff cargoes and agricultural equipment to the Far East and the Far North, where the fleet is the principal, and sometimes the sole, means of hauling. Let me note that our groups are solving this problem, increasing the haul volumes, and overcoming enormous difficulties. You know, they must work amid the complex weather circumstance of icy navigation, with small cargoes, deliver them to settlements which are difficult of access, and work extra-long hours on trips by the efforts of the crews. Great is the importance of our main national maritime artery--the Northern Sea Route, whose 50th anniversary will soon be marked by the country. Thanks to the use of powerful, nuclear-powered icebreakers, we have succeeded in making navigation to many regions of the Arctic a year-round business.

This year the Murmansk Steamship Company alone hauled more than 150,000 tons of food in cabotage. Despite the fact that navigation in the Central Arctic area, because of a complicated ice situation, began 10--15 days late, the groups of the Northeastern Administration, the ports of Tiksi and Khatanga had already by the beginning of October coped with fulfilling the plan and their own socialist pledges with respect to ensuring the deliveries of national economic cargoes to the country's Arctic regions. It is gratifying that, along with the Murmansk and Northern Companies, the Baltic Steamship Company has actively joined in this work.

In toto foodstuff cargoes comprise approximately 16 percent of all hauls on ships of the Ministry of the Maritime Fleet. Our vessels haul large volumes of mineral fertilizers, building materials for rural construction projects, fish products, and other gifts of the sea. Considerable aid is rendered to the country's fishing industry in the bunkering, towing, and repair of ships....

[Question] What about the performance of the task assigned to maritime transport of creating specialized complexes for trans-shipping foodstuff cargoes in the ports of the Baltic, Black Sea, and Far Eastern Basins?

[Answer] We are paying the most persistent attention to carrying out this point of the Food Program. What we have in mind is not simply to create new capacities for trans-loading foodstuffs (our ports have more than 350 such facilities) but rather to introduce exceptionally heavy-duty, all-weather complexes. Five such specialized complexes, based on existing moorages, will be put into operation at the end of the current year and the beginning of 1983 in the ports of Nakhodka, Odessa, Novorossiysk, and Leningrad. Each of them is equipped with portal trans-loaders and ensures a trans-shipment of as much as 600 tons of bulk cargo per hour.

The complexes are equipped with weighing installations and electronic instruments, thanks to which precise batching is achieved, and, it can be said, a receipt is automatically issued for the amount of cargo processed. Special protection has also been provided against the incursion of moisture, telescopic apparatus has been installed, along with suction and reserve nozzles [pumps ?], horizontal and vertical pipelines, winches, etc. Each complex has the capability of simultaneously loading two sections of railroad cars on parallel lines.

Already introduced into operation are four, heavy-duty, floating grain-loaders, each having a production capacity of 500 tons per hour, in the ports of Leningrad, Riga, Odessa, and Il'ichevsk. Taking into consideration the fact that grain loading is greatly complicated during bad weather, enterprises of this sector have manufactured for the already existing grain complexes 16 new, highly productive loaders, 79 all-weather portal installations. This has allowed us to triple the throughput capacities of ports for loading grain under unfavorable weather conditions.

[Question] The Ministry of the Maritime Fleet has at its disposal a high-capacity industrial repair base. How are the sector's plants coping with the orders of the agro-industrial complex?

[Answer] In accordance with the plan for inter-sectorial cooperative deliveries, the Ministry of the Maritime Fleet's ship-repair plants /drydocks/ supply a number of articles and semi-finished items to the enterprises of the USSR Ministry of Machine Building for Light and Food Industry and Household Appliances, the USSR Ministry of the Food Industry, and the USSR Ministry of Land Reclamation and Water Resources. Among these items are steam ferries and barges, ready-made parts and assemblies, 15 types of granulators for grass fodder-meal, pumping stations, forgings and castings made of carbon steel, cast iron, bronze, and many other things. Moreover, for the USSR Ministry of the Fish Industry they carry out annually ship repairs valued as much as 10 million rubles, and they deliver more than 600,000 rubles worth of mechanization means and spare replacement parts.

Significant orders from rural areas are carried out by our plants in their own regions. Thus, the Odessa Ship-Repair Plant imeni 50th Anniversary of the Soviet Ukraine during a brief time period mastered the manufacture of conveyer lines for fodder production and assemblies of cellular batteries used for raising broiler chickens. During the three quarters of the current year the Krasnaya Kuznitsa Ship-Repair Plant of the Northern Steamship Company produced a large batch of parts for farm machinery.

As a rule, our enterprises fulfill all the orders of the agro-industrial complex ahead of schedule, at a high level of quality. Here is just one example. The Il'ichevsk Ship-Repair Plant imeni 50th Anniversary of the USSR, in addition to manufacturing grass fodder-meal granulators, metal feeding troughs for livestock, and bunkers for loading grain in ports, has provided, even beyond the limits of the Ministry of the Maritime Fleet, the high-quality and on-time repair of one of the country's largest bases of the fishing industry, the Vostok. Furthermore, by way of patronage aid to the kolkhozes of the Ovidiopol'skiy Rayon of Odessa Oblast they make here parts of hothouses, furnace boilers, and render assistance in the construction of a silage-storage facility.

[Question] What is being done by the Ministry of the Maritime Fleet for more precise cooperation with combined-type facilities in organizing hauls for the needs of the agro-industrial complex?

[Answer] In conjunction with the Ministry of Railways as well as the republican ministries of motor-vehicle and river transport, we are striving to actively introduce progressive experience in speeding up the processing of ships and railroad cars, ensuring the on-time shipment of all cargoes and, above all, that of food cargoes, to their destinations. Let me note, in particular, the cooperation at transport terminals, which, in essence, are becoming more and more inter-departmental transport associations, as well as the rationalization *[improved efficiency ?]* of hauls in combined-type transportation.

The basic thrust herein is being made on introducing an integrated technology in the operation of the major terminals, based on the continuous plan-schedules in accordance with the method of the Leningraders, the drawing up of integrated plans for economic and social development, patterned after the experience of the Il'ichev workers, along with creating industrial-transport complexes.

Taking into consideration the importance to the state of improving the use of cars, we are striving with all our efforts and means to assist our partners in the comprehensive administration of the transport process and with our competition--the railroad workers--in expediting their turnover, the maximum utilization of cargo capacity. The movement begun by the dockworkers, receivers, and shippers of the Il'ichevsk and Odessa transport terminals for the above-plan loading and processing of cars is becoming more and more widespread. The movement of the "thousanders" has already freed up tens of thousands of cars for the additional hauling of national economic cargoes, including those of foodstuffs. Curtailment of the time of processing cars, as compared to the norm, has become one of the principal points in the socialist pledges of port workers.

In connection with the considerable increase of the ports' processing capacity, there arises the particularly acute problem of balancing with them the material-technical base of the stations at the ports, stations which are called upon to furnish the mooring wharfs, smoothly and in sufficient quantities, with empty cars for grain and other foodstuff cargoes. We see that in the transport terminals railroad workers are applying considerable efforts to this end; however, as it has been said, you won't get far on enthusiasm alone.

In order to ensure the preservation of cargoes, especially grain, workers at the transport terminals must pay more attention to the fitness of cars for such hauls. On the whole, many thousands of unsuitable cars, unwashed or not sufficiently repaired ahead of time, are being sent to the seaports for loading. At the port of Nakhodka alone during the past six months 1,006 unsuitable cars were sent for loading, and 1,854 cars were put into condition at the loading areas.

One of the most important problems confronting us in our mutual cooperation with combined-type facilities is the preservation of foodstuff cargoes, their delivery to consumers without commercial spoilage. However, shippers are delivering potatoes and fresh vegetables even to the North in packaging which does not meet the GOST requirements. Sometimes the sailors and dockworkers have to sort out every batch of cargo.

This problem is not new. We have been confronted with it on several occasions. We take the position that the organs of the people's control and the members of

Gosstandart need to intensify their check-ups on the observance of standards in the shipping of foodstuff cargoes, especially to the country's northern regions, and to hold violators strictly responsible.

[Question] Does the maritime fleet have "land-based" subsidiary farms?

[Answer] Already in operation at enterprises and organizations of maritime transport are more than 40 large subsidiary farms with their own hothouses, poultry farms, and pig-feeding complexes. An active, business-like attitude has been taken toward this matter in the Caspian, Primorskoye, Sakhalin, and Northern Steamship Companies, as well as in the Northeastern Administration of the Maritime Fleet. Large pig-feeding complexes for a thousand or more head each are being created on the subsidiary farms of the Il'ichevsk and Nikolayevsk ports, at the Sovgavansk Ship-Repair Plant, and other enterprises. The subsidiary farm of the Kaspmorsudoremont Association has provided for the construction of a poultry farm with a capacity of 40,000 broiler chickens.

Along with construction and expansion, we are concentrating our attention on increasing the profitability of subsidiary farms. For example, over the period of a year at the port of Tiksi the inhabitants of this Arctic settlement obtained more than 2,200 quintals of milk and 100 quintals of meat from their own farm. Moreover, the number of pigs and cattle is constantly increasing. The average milk yield for each grazing cow in the dairy farm has reached almost 3,000 liters. And this is under conditions within the Arctic Circle! One of the most profitable subsidiary farms in the sector is the sovkhoz of the Caspian Steamship Company, which provides not only hundreds of thousands of rubles profit annually, while supplying the group of the steamship company with its own produce, but it also supplies fresh vegetables to maritime transport enterprises situated in the far-off Arctic regions.

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OCEAN AND RIVER

TRANSSHIPPING PROBLEMS AT RIVER PORTS

Moscow RECHNOY TRANSPORT in Russian No 8, Aug 82 pp 9-10

[Article by P. Olenov, chief of a division of the Main Administration of the MRF [Ministry of the River Fleet]: "Solving the Problems of Mixed Transport"]

[Text] Analysis of the work of the transshipment transport centers shows that the volume of shipments of freight in direct mixed railroad and water transportation has tended to decline.

One of the main reasons deterring the development of mixed railroad and water shipments of freight is the systematic failure of the railroads to fulfill the norms for delivering loaded and empty cars to the transshipment ports. In addition, a factor retarding the development of mixed railroad and water shipments is the riverside enterprises' inadequate development of mooring facilities for receiving and shipping the freight. Most of the ministries are not fulfilling the program for construction, expansion and remodeling of the departmental mechanized mooring facilities. There is also a constant underdelivery of the planned empty cars for the shipment of building materials from the ports. Also, for a number of transshipment centers a considerable insufficiency in the railroad stations' traffic capacities from the river ports.

<u>Indicators</u>	<u>1975</u>	<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>
Transshipment of freight from railroad to river transport, millions of tons	25.5	24.8	24.2	25.3	24.4	24.3	24
Transshipment from river to railroad transport, millions of tons	24.5	23.1	23.8	24.3	21.2	22.8	22.5
Total, millions of tons	50.1	47.9	48	49.7	45.6	47.1	48.5

The Ministry of the River Fleet is constantly working to speed up the processing of railroad cars and to increase the static load per car.

From 1975 to 1981 the ports obtained a definite improvement in the use of the railroad rolling stock with respect to both carrying capacity and amount of time in processing. Whereas in 1975 the average load per car was 54.88 tons, in 1981 the average load reached 59.88 tons. As a result, in 1981 alone the transshipment ports achieved a saving of more than 34,400 empty cars.

The average time for the processing of cars at the transshipment ports has been reduced from 4.6 hours in 1975 to 4.27 hours in 1981.

Despite the MRF work to switch the freight from railroad transport to river transport, they were unable to increase to any significant extent the volumes of freight shipments in direct mixed rail and water transport. In our opinion, the main reasons, in addition to the above, which operated to deter the switching of freight to river transport are the following: the tendency of some of the ministries and departments (the Ministry of Electric Power USSR, the Ministry of Construction Materials USSR, the Ministry of the Gas Industry USSR, the Ministry of the Timber and Paper Industry USSR, and others) to underestimate the river transport's potential for providing for their shipments in full volume; the reluctance of the managers of the riverside enterprises to build the simplest mooring installations and warehouses for receiving and distributing the raw materials and products; the negative attitude of the MPS [Ministry of Railways] in respect to a solution of the problem facing them; the one-sided planning of norms for the delivery of railroad cars to the ports. Instead of transferring the bulky freight to river transport, the MPS has suggested changing it in the main to package and piece goods. The railroad people consider it inexpedient to develop in mixed transportation only the freight shipments which proceed with one transshipment.

No effective measures are being taken with respect to the ministries and departments which are responsible for nonfulfillment of the assignments for rationalization of the shipments and switching of the freight to river transport. Thus the 1981 plan provided for the shipment of 6.3 million tons of Kuznetsk and Karaganda coal and the amount actually shipped to the transshipment ports was 5.4 million tons. Also unfulfilled were the assignments for the shipment of lumber and mineral ores.

In 1982-1983 the MRP has the full potential for switching to river transport without additional capital investments about 8-10 million tons of national economic goods, including 2.5-3 million tons of petroleum products in the Volzhsk, Kama, Ve-Irtysh and Yenisey and Lena basins; 2-2.5 million tons of coal for the thermal electric power stations of Tula and Kashira; 1.6 million tons of KMA [Kursh magnetic anomaly] ore and iron ore concentrate from the Kola peninsula for the Cherepovets, Magnitogorsk, Chelyabinsk and Nizhniy Tagil metallurgical plants; up to 1 million tons of lumber from Siberia, Komi ASSR and Arkhangel'sk Oblast with transshipment at the ports of the Kama and Upper Volga for the southern regions of the country; 0.5 million tons of sulfur raw materials from the Ural combines; 1.2 million tons of gravel and other mineral building materials which tend to employ river

transport; 150,000 tons of molding sand from the Burtsevskiy pit; 2.8-3 million tons of foreign trade goods.

To further the process of switching the new freight flows from railroad to water transport, to cut down the times consumed in processing the ships and railroad cars, and to reduce the transport costs, it would be desirable to work out and introduce a procedure for complex planning of the shipments from sender to recipient within a single transport system for the country and a system of distribution based on the types of transport. This would make for further switching of freight from the railroads to river transport, especially the freight transported in parallel with the water routes. At the time of the compilation of the operational quarterly plans the MPP and the MPS must be granted the right to switch from direct rail transport to direct mixed rail and water transport in the case of the large-tonnage freight which is transported during the navigational period in parallel to the water routes.

It is desirable to include in the product list the basic goods which are transferred from water transport to rail transport and to take account of these goods in the fulfillment of the plan. The MPS must provide the ports with loaded and empty cars at the proper time and in the amounts agreed upon. It must also use the cars which have been unloaded at the ports and ship the freight in the proper direction in keeping with the fulfillment of the regulation assignments. It is desirable to implement the measures needed to increase the carrying capacity of the railroad stations located at the ports and to give special attention to the development of the Ufa, Kambarskiy, Krasnoyark, Tomsk and Ust' Kut railroad centers.

In the immediate future we must accomplish a complete shift to the package method of transporting such goods as cement, glass, slate, bricks, pipe of small and medium diameter, timber and chemical materials, fertilizers, flour and mixed fodder, house components, and fine ferrous concrete.

For increasing the volume of the shipments of freight in mixed transportation considerable importance attaches to the role played by over-all socialist competition aimed at the introduction of progressive methods in the loading and unloading work and fuller use of the freight capacity and freight space of the transport means.

A positive solution of these problems will enable us to switch these freight volumes from rail to river transport and to decrease the intensity of the work of the railroads.

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OCEAN AND RIVER

ADDITIONAL REPORT ON NUCLEAR-POWERED LIGHTER CARRIER

Moscow VODNYY TRANSPORT in Russian 2 Oct 82 p 4

[Article by Yu. Stvolinskiy: "The Fifth Nuke"]

[Text] There are now three nuclear-powered icebreakers operating in our country--the "Lenin," "Arktika" and "Sibir." A fourth--the "Rossiya"--is under construction at the Baltic Shipyard in Leningrad, and at the "Zaliv" Shipyard in Kerch preparations have begun to build a fifth nuclear-powered vessel--an ice-breaking cargo-lighter-container carrier. They designed it in Leningrad.

There are elements of incompatibility embedded in the very idea of such a vessel. The LASH vessel and icebreaker must have different lines of the stern, lines completely different from one another. Yet they had to be merged.

The icebreaker must be very strong. To be specific, it must have spoon stern so that the vessel can move in reverse. LASH vessels made their appearance relatively recently. These are large vessels--a result of the evolution of container carriers. The LASH vessel is that same container vessel except that its containers (the lighters) float. And, of course, they are considerably larger than conventional containers.

The LASH vessel does not need an equipped port; it lowers the lighters into the water in the roadstead, and then goes on, leaving them to the care of a local tug. On its return it picks them up empty.

The LASH vessel is especially suitable along the thousands of kilometers of polar shores, where there are few large harbors and where the navigation season is short.

But only a special vessel can operate successfully in the Arctic. That is why the characteristics of the LASH vessel and the icebreaker had to be combined. The latter, as we said above, must have a spoon stern. The stern of the LASH vessel, on the contrary, is designed flat, a transom stern. Together with the consoles, which are a continuous extension of the sides, the flat transom makes a dock whose purpose is to serve as a shield against waves and to create optimum conditions for raising and lowering the lighters.

At first there was no success even on paper: the vessel of the icebreaker type and the LASH vessel seem to be mutually exclusive. Yet the necessary solutions were nevertheless found.

I am looking at a photograph of a model. The tip of the bow is that of an icebreaker, the high tower-deckhouse has been moved to the very bow (all of the crew's quarters are concentrated here, far from the machinery and above the sides, against which the blocks of ice crash). There is a huge gantry crane, which moves on rails a quarter of a kilometer in length. It stands like a white horseshoe up over the lighters, which stand in two tiers above the upper deck. The crane is designed to raise and lower the lighter. That is the purpose of the strong cantilevers which are like an extension of the stern and which carry the rails of the crane. The crane moves out on them over the water carrying the lighter to be lowered or to raise a lighter.

The calculated time of each lowering or raising with the 500-ton crane is about 20 minutes. The nuclear-powered ice-breaking cargo-lighter-container carrier is designed for 74 lighters (370 tons each) or 1,330 containers.

The Basic Directions for the Economic and Social Development of the USSR Over the Period of 1981-1985 and up to the Year 1990 call for "replenishing the fleet with specialized vessels--container carriers, LASH vessels, railroad ferries, vessels for Arctic navigation, and icebreakers. Begin to install nuclear power plants in cargo vessels." The first step toward carrying out this program is the nuclear-powered ice-breaking cargo-lighter-container carrier.

Its principal characteristics are these: length--260 meters, beam--32.2, hull height--18.3 meters. Displacement about 61,000 tons, and power plant capacity 40,000 HP. Calculated speed in open water about 20 knots, but the designers assume that it will be higher.

Another problem that was not easy to solve: to combat the icing up of the parts of the hoisting mechanism.

In order to essentially improve the economic characteristics of the future vessel, the design of the power plant was altered somewhat. On icebreakers the steam turns turbogenerators, and the resulting electric power goes to the propeller motors, which turn the propeller shafts and propellers. On the new LASH vessel a steam turbine operates directly on the screw.

The propeller motors of nuclear-powered icebreakers absorb and extinguish "ice moments"--the blows of the propellers on the ice, wedging, and the like. Since in the LASH vessel the screw is connected directly to the turbine by the propeller shaft, a special clutch was required to eliminate the "ice moments" which would destroy the engine. At a capacity of 40,000 HP on one shaft the clutch would assume altogether unsuitable dimensions and weight.

It had to be done without. That is why the screw (variable pitch, diameter about 7 meters) is enclosed in a ring-shaped shroud. This protects the screw. Other measures have also been developed; to be specific, the reduction gear has been reinforced, its static strength has been increased.

The lighter-container carrier will be a highly mechanized and automated, strong and reliable vessel. It has a large-capacity power generating plant: three turbogenerators, and four automatic standby diesel generators are provided for.

The navigators will be aided by a special navigation system including an electronic computer. In a matter of seconds the system will give recommendations on passing oncoming vessels, will make it possible to determine the vessel's position at sea at any moment regardless of weather. This system's cargo complex will take over supervision of the process of loading or unloading the vessel and will avert possible human errors.

The designers have also been concerned about the living conditions for the crew. Single cabins with air conditioning and hot and cold water have been provided for all seamen. Aside from the wardroom, the crew's mess and saloons customary on all our vessels, there will be an athletic complex with an indoor swimming pool, sauna, gymnasium, movie and lecture room and library, as well as medical station. It is taken into account that the vessel is intended not only for the Arctic--it will sail there approximately 3 months a year, and the rest of the time will be in other regions. That is why the conditions for the life of the crew have been adapted to various latitudes.

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OCEAN AND RIVER

WORKPLACE HEALTH, SAFETY RULES VIOLATED

Moscow VODNYY TRANSPORT in Russian 2 Oct 82 p 2

[Article by Ye. Merzlov, chief of the department for workplace health and safety standards, chief technical inspector of the Central Committee of the Trade Union of Maritime and River Fleet Workers: "What an Inspection Showed"]

[Text] In June-August of this year the Central Committee of the Trade Union of Maritime and River Fleet Workers, jointly with the ministries of maritime and river fleets, conducted inspections at enterprises of the Murmansk, Caspian, Latvian and Far Eastern maritime shipping companies, the Lena United River Shipping Company, and the shipping company Volgotanker into progress in the effort to create safe working conditions and prevent job accidents.

The inspection showed that much has been done to improve conditions for employees in ports, at shipyards and at other enterprises.

Large resources are being expended to create and acquire new equipment to mechanize and automate operations and for up-to-date equipment and attachments. At the same time organizational matters are not being resolved in the best way in most of the shipping companies and enterprises checked.

The inspection revealed serious oversights by managers of shipping companies and their subordinate enterprises in the organizational effort to prevent accidents and to follow up on execution of orders and instructions of ministries and their own orders concerning workplace health and safety. The chiefs of shipping companies, ports, fleet REB's [maintenance and operations facility] and shipyard directors are not penetrating deeply into the state of affairs with health and safety and are not requiring that engineering and technical personnel, their own deputies first of all, create safe working conditions at every work station.

It is, unfortunately, impossible to name a single chief of a shipping company and probably even chief of a port who at least once a quarter has personally, not formally, taken part in surveying enterprises before the results of the effort are totaled up for the third level of the system of permanent monitoring. In 1982 not a single shipping company chief took part personally in investigation of accidents with a fatal outcome. By and large the participation of these managers consisted of presiding at conferences where the results were

summarized and of the reading of the report prepared by his assistant for safety.

The job descriptions of deputy chiefs of shipping companies and other supervisory engineering and technical personnel of shipping companies, except for the Murmansk, do not include duties related to workplace health and safety. As a result many deputy chiefs of shipping companies and enterprises, chiefs of staff services and departments, KhEGS [cost-accounting (khozraschet) operational group of vessels], and other structural subdivisions have not taken part in guaranteeing safe working conditions.

In certain shipping companies and enterprises a formal approach has been taken to writing up job descriptions. For instance, an order of the chief of the Lena United River Shipping Company this May distributed duties among deputies, but not a word did it say about workplace health and safety (except for mentioning the chief engineer's duties in this regard). Yet after all Order No 107 of the minister, which defines the principal duties of salaried officials of the administration of the shipping company concerning workplace health and safety, was issued back in 1978. And in the port of Osetrovskoye the duties of the deputy port chief concerning workplace health and safety were copied word for word from the order mentioned without taking into account the peculiarities in their activity.

Deputy chiefs of shipping companies for employee welfare are essentially not concerned with these matters. Yet often the employee welfare facilities themselves make a dismal impression--faucets leak, and they are damp and unpleasant. One can see "barn" locks on the lockers; rarely are belongings kept in the open. If the deputy for employee welfare were in the habit of visiting these facilities, no doubt the possibility would be found of putting them into order--painting them, freshened up, there would be flowers, there would be soap, clean curtains would be hung up, and so on. The employee facility is not only the beginning of the period of rest, but also the beginning of the worker's shift of work, and that beginning should be pleasant, rather than embittering him with irritating trifles. Moreover, at some enterprises there simply are no sanitary and employee welfare facilities. At the Zhatayskaya SSRZ [Ship Repair Yard] of the Lena United Shipping Company, for example, the sanitary and employee welfare facilities are only 60 percent adequate, and those building and repairing ships do not have such facilities at all.

Up to now the staff services and departments of shipping companies which are directly concerned with organizing production at the local level and in the fleet, are not involved in the work of guaranteeing healthy and safe working conditions. This entire effort at the local level is mainly the responsibility of safety personnel, whose number as a rule is always below the assigned allowance, and in certain cases the positions are held by incompetent people who do not have sufficient qualifications. For instance, in the Astrakhansk administration of Volgotanker all orders concerning workplace health and safety coming either from the ministry and trade union central committee or from the shipping company are "assigned" to the assistant for safety, who is supposed to decide who is to be informed of them. As a result, for example, an order of the chief of the Caspian Shipping Company on the results of the

third-stage check for 1981 simply went unprocessed, since the assistant happened to be on vacation at that time.

At the Alekseyevka REB of the fleet of the Lena United River Shipping Company workplace health and safety are the concern of a worker who has neither experience nor the appropriate education. In the Osetrovskoye Port of this shipping company the safety department was inoperative at the time of the inspection (of the five members of the staff one was present--he was called back from leave because of the commission's arrival).

One's attention is caught by the fact that at enterprises of the Murmansk, Caspian, Latvian and Far Eastern maritime shipping companies, the Lena United River Shipping Company and Volgotanker the commission discovered a large number of shortcomings related to poor operation in the very first stage of ongoing monitoring. Yet those shortcomings should have been discovered and corrected independently of any commissions whatsoever.

I will cite only some of the most typical violations: electric panels are not enclosed, dielectric mats are absent or have not been tested, "bugs" are used instead of combination fuses, conductors are jammed, and it is not uncommon for nonstandard portable ladders to be used. There are quite a few cases of violations of rules in the performance of electric welding, in the use of processing equipment, in the operation of cargo-lifting machinery and internal-combustion lift trucks.

At many enterprises, especially river enterprises, the wearing of hard hats has not yet become the rule.

At the Osetrovskoye Riverport and the Riga Seaport flowcharts are not corrected in time, nor have all types of cargo been dealt with, and the grounds are littered with junk. In the port of Osetrovskoye there are flagrant violations of safety rules in the storage of cargo.

In the ports of Nakhodka and Vladivostok many violations were discovered concerning electrical safety, cargo storage rules, and the rules governing the conduct of cargo-handling operations. The system for management of workplace health and safety based on the experience of the "Teplokhod" Plant has still not become widespread enough, and the effort for adoption of workplace health and safety standards has not been vigorous.

An analysis of the causes of accidents occurring in 1981 and in the first half of 1982 showed that, just as in the past, more than 90 percent of them occurred for recurrent causes: unsatisfactory organization of production 40 percent, unsatisfactory maintenance of work stations, grounds, passageways and thoroughfares 15 percent, violation of rules 12 percent. All of this indicates the lack of elementary attention to this matter on the part of professional managers, trade union committees and ship captains. Moreover, correction of these shortcomings does not require any capital investment at all; the job merely needs to be tackled and the situation finally put into order.

One is not gratified by the attitude toward workplace health and safety problems displayed by the headquarters of the ministries, with the exception of workplace health and safety departments. For example, in connection with the change in the structure of the Ministry of Maritime Fleet the newly created chief administrations and all-union associations have drafted regulations on their subdivisions. But not one of them has treated the questions of workplace health and safety. The authors of these regulations refer to the fact that the Ministry of Maritime Fleet has an independent workplace health and safety department, which, in their opinion, is to handle the entire effort (the department consists of five persons). Only after intervention of the trade union central committee did they begin to revise the "Regulation on Main Administrations and All-Union Associations" and include in it a section entitled "Workplace Health and Safety."

In Order No 107, which we have already spoken about, the effort concerning workplace health and safety is headed by order of the ministry by one of his deputies. This is a good order.

But, unfortunately, in actual fact it has not all turned out that way by any means. Responsible officials of the ministry sent on trips do not usually get into the problems of workplace health and safety.

For example, during 1982 six top officials of the central headquarters of the ministry visited the riverport Osetrovskoye for various periods of time, but not one of them concerned himself with the problems of workplace health and safety.

Speaking at the 17th Congress of USSR Trade Unions, Comrade L. I. Brezhnev said: "Concern about improving the life of the workers is inseparably bound up with concern about economic development. It is not possible to guarantee a rise in well-being without proper development of production. At the same time development of production itself will be all the more successful if living and working conditions are improved."

These words remind us time and time again that the managers of all levels of production must first of all be imbued with serious responsibility for guaranteeing unswerving enforcement of safe and healthy working conditions.

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OCEAN AND RIVER

BRIEFS

FINNISH ICEBREAKER--Finnish shipbuilders have built the icebreaker "Mud'yug" in Helsinki Shipyard; it is intended for the Northern Maritime Shipping Company. This is the prototype ship of a new series. On 30 September the crew of Arkhangelsk seamen, under the guidance of Captain V. Koshunyayev, took it out for running trials. The new icebreaker, which is 88 meters long and has a beam of 20.8 meters, has fundamental differences from those in operation in the shipping company. The vessel is equipped with two variable pitch propellers and a special system for washing the hull with air. Many production operations are fully automated. The engine's total capacity is 10,000 HP. When the icebreaker is put into service, the capabilities of the seamen of the North will be substantially expanded in guaranteeing year-round navigation of the Arkhangelsk Seaport, which is the oldest seaport in the country. [Text] [Moscow VODNYY TRANSPORT in Russian 5 Oct 82 p 1] 7045

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MISCELLANEOUS

GOSSNAB OPTIMALIZES ITS SHIPPING

Moscow MATERIAL 'NO-TEKHNICHESKOYE SNABZHENIYE in Russian No 8, 1982 pp 22-25

[Article by V. Kovalenko, deputy chief of the Shipping Administration of USSR
Gossnab: "By Optimum Routes"]

[Text] Successful performance of the task set by the 26th CPSU Congress of economical and optimum utilization of physical resources in the national economy depends in large part on efficient, prompt and uninterrupted operation of the entire transportation system and of every branch of transportation individually. After all, delivery of goods from production points to consumption areas requires a considerable expenditure of fuel and energy and other physical resources. In order to reduce those expenditures it is indispensable to make a portion of transportation equipment available through optimum location of production and consumption, through accelerated development of continuous and pipeline transportation, and by reducing the volume of goods to be carried.

Coal shipments occupy a large share of the country's volume of freight. This is related to the change in the makeup of the fuel and energy balance and to the increased mining of the fuel in eastern regions, whereas the cheap strip method of mining is predominant, and to reduction of mining in the European part of the country. As a result in the years of the 10th Five-Year Plan the absolute length of the coal haul increased nearly 100 km, while the average length of the haul of rail freight in general increased 30 km.

Performance of the comprehensive program for further improvement of the location of the productive forces, construction of energy- and heat-intensive enterprises where coal is being mined, development of coal beneficiation and improvement of the proportions in the fuel and energy balance will undoubtedly have a constructive effect toward making shipments more orderly.

In speaking about the need to perform a number of measures to shorten the average distance various types of freight are hauled, we cannot forget that the average length of the haul is not in and of itself an altogether decisive criterion as to the optimality of any particular shipment. After all, the results of the operation of transportation do not depend only on distance, but also on the volume of freight to be delivered. At this point we need to take into account all the component indicators: quality, cost of mining

(production), volume, and so on. This has to be discussed because up until the present time the principal criterion as to the optimality of the operation of rail transportation has been the lowest volume of ton-kilometers performed. But this indicator, which is becoming obsolete, does not always correctly and objectively estimate the optimality of established flows of freight (when full costs are taken into account) by any means.

In the interests of the entire economy it is obviously more sensible to undertake a certain overexpenditure of resources involved in transportation if one achieves thereby a far more sizable saving on production cost, consumption of standard fuel, and so on. For instance, the costs of delivering Kuznetsk coal to the central part of the country are more than 12 rubles per ton of standard fuel as against 5 rubles for Donetsk coal. But one should take into account the cost of mining the coal. In the Kuzbass, where the strip method is used, they are between two-fifths and one-half as high as they are at the new underground mines in the Donbass. That is why the total costs of mining and shipping coal from the Kuznetsk Basin to the area of consumption turn out to be 30 percent lower than the costs of mining and hauling Donetsk coal. If we take into account that in the years of the 10th Five-Year Plan the freight flow of coal in the "east-west" direction increased by 30 million tons, the real benefit to the national economy from this kind of shipment can be discovered by the simplest arithmetic.

Of course, this does not remove from the agenda the effort to achieve any possible relative reduction of distant hauls by developing economically sound shipments of coal from other deposits, but only when consideration is paid to the real situation as to resources, mining, cost and quality. Solving this problem will be greatly furthered if nearly the entire growth of electric power generated in the European part of the country comes from nuclear fuel, if large nuclear heating stations are built, and if high voltage power transmission lines are put into service between Ekibastuz and the center and between Ekibastuz and the Urals.

None of what we have said, of course, denies the planned effort made by USSR Gosplan and USSR Gossnab for more than 10 years now to establish better order in shipments of freight by all branches of transportation, nor does it cast out on the real saving of resources. But in our opinion this effort should be adjusted and raised to a higher qualitative level so as to take into account the main motto of the current 5-year plan--"The Economy Must Be Economical."

Real steps in this direction have already been taken. USSR Gosplan and USSR Gossnab drafted and approved measures on the basis of recommendations of ministries and departments toward making freight shipments more orderly in the 1981-1985 period. Their performance will make it possible to reduce the effort of the railroads by 160-170 billion ton-kilometers and to save about 1.5 million tons of standard fuel. Plans call for reducing by 10 million tons the volume of slate carried by improving the beneficiation of the coal at beneficiation facilities now in operation or to be introduced. Plans call for reducing by 8 billion ton-kilometers cross-hauls of coal from different basins thanks to sensible reorientation of the fuel patterns of power stations toward the most economical types of fuel.

The program which has been set in motion for putting order into the shipment of freight of ferrous metallurgy and raw ores for metallurgy will make it possible to relieve the railroad of 18 billion ton-kilometers of effort in inefficient directions and to improve the movement of shipments in accordance with optimum schemes.

Much attention has been paid to further improvement of specialization of existing petroleum refineries so as to improve the supply of the most common petroleum products. There are plans to build and put on stream 10,000 km of petroleum pipeline and 6,000 km of all-product pipeline. Delivery of crude petroleum and petroleum products to the point of consumption will free the railroads from an effort amounting to 36 billion ton-kilometers.

Equally important are measures being carried out in other sectors of the economy to eliminate inadvisable shipments. Moreover, in the current 5-year period much attention is being paid to making rail freight shipments more orderly, to drafting and updating charts of freight flows, and to transfer flows of freight to other branches of transportation when this is economically advisable. The work that has been done has made it possible to substantially hold down the increase in the average distance of hauls that in recent years has been projected. Last year the total increase in the distance of the average haul was 8 km as against 14 km in the previous year. The average length of the haul of petroleum products was reduced by 24 km, there was a 4-km reduction for ferrous metals, and a 22-km reduction for chemical and mineral fertilizers.

It should be emphasized that about 60 percent of the planned saving on the railroads were to be achieved by agencies of USSR Gossnab by improving plans for distribution of products and for optimum assignment of consumers to suppliers. Large potential still exists in Soyuzglavugol' [coal], Soyuzglavmetall [metal products], Soyuzglavtrubsnabsbyt [pipe supply and sales], Soyuzglavkhim [chemical products] and other main administrations. Unfortunately, USSR Minneftekhimprom [Ministry of Petroleum Refining and Petrochemical Industry], USSR Goskomnefteprodukt [State Committee for Supply of Petroleum Products], Minneftegazstroy [Ministry of Construction of Petroleum and Gas Industry Enterprises], USSR Minlesbumprom [Ministry of Timber, Pulp and Paper, and Wood Processing Industry], USSR Minchermet [Ministry of Ferrous Metallurgy], Minudobreniy [Ministry of Mineral Fertilizers Production] and USSR Minsel'khoz [Ministry of Agriculture] are not displaying sufficient responsiveness in carrying out the measures that have been agreed on and established.

There are many shortcomings in the organization of shipments involving rail and water transportation. In 1981, for example, 1.1 million tons of freight less than in 1980 were transshipped from the railroads to river transportation, which was 2.7 million tons less than at the beginning of the 10th Five-Year Plan. This situation is the result of the systematic violation of transportation discipline by partners and especially the railroads in hauling the cargo promptly from the ports where the second transshipment takes place. What is the result of this? A sharp increase in delivery time, interruptions in the stable and guaranteed supply of raw materials and supplies, and, as a

consequence, reduction of the development of the volume of combined freight shipments.

Rail transportation does have its advantages. They include the ability to operate year round, quite negligible dependence on geographic conditions, and the direct connection between production points and consumption points. Water transportation also has advantages. They include the far smaller fuel consumption and reliable continuous delivery of cargo.

At the same time we cannot but take into account that transshipments of freight from one branch of transportation to another are inevitable in combined rail-water transportation. Not uncommonly freight shipments are held up for a long time at junctions between the two branches of transportation--at the transshipment points. Tardiness in shipping out the freight compounds even more the already problematical transportation situation.

Meanwhile the time factor has extremely great importance in the context of the socialist conduct of economic activity. That is why the speed of shipment and delivery of freight is perhaps more important than anything to take into account when flows of freight are being transferred from single-modal to intermodal rail-water shipment. After all, when the rate of movement is increased, this not only speeds up the turnover of rolling stock and increases traffic capacity, but above all it removes from the distribution sphere a large volume of inventories, speeds up their delivery, and creates conditions for preserving the freight and reducing losses.

But recently a tendency has been noted toward increasing intermodal shipments with two transshipments. Not only does this not reduce the volume of effort of the railroads, on the contrary, it increases it. Moreover, when the transfer is made to intermodal shipment, no consideration is usually given to the indicators of the national economy as a whole, nor to the opinions of shippers and consignees. This is done in order to serve the narrowly departmental interests of river or rail transportation.

Consideration should be paid in development of intermodal shipments to the possibility (or need) to convert in that direction freight carried year round, but consumed seasonally or shipped to build up industrial or winter stocks, and so on. If accelerated delivery of freight does not increase resources for productive consumption, then the advantage is with direct shipment.

Taking into account that USSR Gosplan and USSR Gossnab have planned in the 11th Five-Year Plan to convert about 30 million tons of various freight from rail to river transportation, the MPS [Ministry of Railways] and RSFSR Mirechflot [Ministry of River Fleet] should qualitative improve their interaction, eliminate bottlenecks in their work, and guarantee that the transportation conveyor operates continuously. In this important effort agreement has to be reached with other ministries and departments, above all with USSR Minenergo [Ministry of Power and Electrification], USSR Minchermet, USSR Minstroymaterialov [Ministry of Construction Materials] and Minudobreniy, in speeding up the construction and activation of their respective departmental docks. Because of the insufficient number of docks, the development of otherwise advisable intermodal rail-water and direct water shipments is being held up.

There has been a considerable increase in the role and participation of USSR Gossnab in optimalizing transportation-economic connections. It has become an established practice in its work to listen to regular reports from the union-level main supply and sales administrations on improved computerized assignment of consumers to suppliers of products, expansion of the list and volume of freight carried under optimum plans, on measures being taken to reduce the average length of the haul, and on concentration of freight flows with respect to shipping points and destinations in order to increase the level of unit-train shipping. These questions are systematically taken up in sessions of USSR Gossnab.

Great effort is being made locally by gossnabs of the union republics and main regional administrations. In all regions economically inadvisable shipments are being eliminated, the importation of metal products, timber, building materials, cement and other products for production and technical purposes and also of castings and forgings under cooperative deliveries is being reduced by reducing the exports of products of the same kind and by organizing and expanding exchange operations between individual enterprises. At the same time more effective day-to-day supervision is being established over the course of performance of measures to optimalize shipments which are every year adopted by USSR Gosplan and USSR Gossnab.

In addition a great effort is being made to concentrate flows of freight and to increase the size of the order. As a result favorable conditions are being created for further increase of shipments in unit-trains. Certain holders of stocks plan to concentrate delivery of motor vehicles in periods of the year. For instance, up to 50 percent of the trucks and 70 percent of the buses from the annual stocks of USSR Minlesbumprom and USSR Gosleskhoz [State Committee for Forestry] are to be delivered in the first quarter.

USSR Gossnab and the MPS have drawn up a list of enterprises and organizations manufacturing motor vehicles and agricultural machines which are to ship their products only in unit-trains or in consolidated groups. Over the last 10 years the volume of freight shipment by unit-trains has risen 33 percent in rail transportation, and the level of unit-train shipment has risen 6 percent. Many enterprises in the coal and metallurgical industries have achieved a high level of unit-train shipment. Work to make unit-trains more efficient is continuing jointly with sales agencies. The minimum size of the truck shipment going to rural areas has been doubled, and the minimum shipment of agricultural machines quadrupled.

At the same time we should note the inadequate level of unit-train shipment of timber and grain. At present it does not exceed 20 percent.

In order to increase the unit-train shipment of rail freight, especially of motor vehicles and agricultural machines, grain and timber, USSR Gossnab, USSR Gosplan and USSR Goskomtrud [State Committee for Labor and Social Problems] have envisaged specific measures to further development of these shipments, to speed up delivery of freight, and also to give personnel of industry and transportation greater material motivation to improve unit-train shipment.

The effort to preserve the freight being carried and stored and also to improve the use of transportation equipment in loading and unloading operations will contribute to conservation of physical resources. There are still many serious shortcomings in this area. Last year alone losses from shortages, theft, spoilage and damage during transportation amounted to about 20 million rubles for all our organizations. Large losses occurred in the gosnabs of UkrSSR, KASSR, LISSR and KISSR, as well as in the Northern Caucasus, Volga-Vyatka, Central Chernozem, Northeastern, Sakhalin and other main regional administrations. The closest attention should be paid to the questions of preservation of cargo, reduction of losses and losses incurred in this way.

There has to be substantial improvement in the use of transportation equipment at enterprises of the system of USSR Gossnab and a larger contribution to conservation achieved thereby. Nonfulfillment of allowances for the idle time of railroad cars is resulting in large payments of penalties to the railroads. Last year alone the total amount of penalties was nearly 5 million rubles. Moreover, it was more than 200,000 rubles greater than in 1980. This increase is the result of above-allowance idle time of railroad cars at enterprises of many main regional administrations. Measures are not being taken effectively enough to reduce the idle time of cars in the Moscow City, Volga, Far Eastern, and East Siberian main regional administrations. Figures have dropped in the gosnabs of ESSR, LaSSR and KISSR. Reduction of the standing time of railroad cars represents an important potential saving.

The Collegium of USSR Gossnab has taken up the problems of material and technical supply agencies in further strengthening the effort at optimization of freight shipments and adoption of unit-train organization. An elaborate decree has been adopted aimed at substantial invigoration of activity to put order in freight traffic.

There are no trifles in successfully conserving physical resources and in their optimum use. There must be no passivity or sluggishness here. Only creative initiative and a high sense of responsibility on the part of every worker will yield appreciable results for the national economy.

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MISCELLANEOUS

NEED FOR IMPROVED REFRIGERATED TRANSPORT FACILITIES DISCUSSED

Moscow IZVESTIYA in Russian 13 Nov 82 p 3

[Article by IZVESTIYA economic reviewer V. Romanyuk: "A Refrigerator On Wheels is Needed--Improving the Use of Refrigerator Transport Means a Significant Reduction in the Losses of Food Products"]

[Text] Of all the outlays for the production and sale of fruit and vegetable products transport expenditures comprise the greatest proportion--about 40 percent. At the same time, it is in precisely this link of the chain from field to counter that the greatest losses take place. Who would not like to taste fruit or berries which are described as "covered with dew." But after having at times gotten over thousands of kilometers--in unadapted railroad cars, in slow moving barges, in open truck bodies under the scorching sun and the rain--the amber-colored bunches get to the store counters often already rotted, red-cheeked tomatoes, crushed and striped watermelons--cracked open.

The avoidance of these losses is helped by the refrigerators on wheels--the truck refrigerators and the vehicles with isothermic bodies. But as yet this specialized transport carries only a negligible proportion of the products. In the general fleet of vehicles produced at the enterprises of the Minavtoprom [Ministry of the Motor Vehicle Industry] USSR specialized transport comprises only a small percentage proportion. Thus, in the current year of 2.16 million vehicles of all types, refrigerator motor vehicles comprise not much more than 4,000 units. Next year the plan calls for increasing the production of them by 615 units, chiefly vehicles of small freight capacity such as the ones produced at the Baku specialized motor vehicle plant.

According to the Institute of Complex Transport Problems of Gosplan USSR, large-capacity motor-vehicle refrigerators alone should be produced in a quantity of not less than 5,000 a year and the small-tonnage ones--with a freight capacity of 0.5-3.5 tons--in the amount of 7,400 units. It cannot be said that nothing has been done to meet the actual requirements. Work is in progress to develop these capacities at the Krasnoyarsk and Tiraspol' motor-vehicle trailer plants: at the Krasnoyarsk plant this work will result in refrigerators with a freight capacity of 11.5 tons for the MAZ three-axle truck tractors, which are capable of transporting up to 22 tons of perishable

products at a time. Two of these enterprises can produce on the whole 3,500 refrigerators on wheels, which does not meet the actual needs. Especially great is the agroindustrial complex's need for refrigerator semitrailers: the norm recommendation is for two-three semitrailers for each truck tractor; in practice the correlation is at best one to one.

The assigned products list of refrigerator motor vehicles and semitrailers necessary for the national economy comprises seven models which are included in the list of types of specialized rolling stock. But the plan for putting them in production has been fulfilled for practically none of the models. What is the remedy for this? In the opinion of many IZVESTIYA readers, the arrears of specialized freight motor vehicle transport can be eliminated by reorienting some of the passenger car production capacities on hand and reorienting the enterprises engaged in the production of motorcycles, mopeds and other transport vehicles for individual use. "Our factory settlement Lezhnevo in Ivanovo Oblast, which has a population of about 10,000 persons," writes reader I. Barulin, "is literally 'larded' with motor vehicle and motorized equipment. But there is not, for example, even one vehicle for the removal of food wastes. So is it possible to curtail the production of these 'motorized toys' and to produce what is more useful for the national economy?"

What is the reason for this? The national economy suffers enormous losses because procurement, trade and the consumer cooperatives are forced to use unsuitable vehicles for transporting perishable products. And the shortage of specialized transport for the various sectors of the national economy, especially that for the agrarian-industrial complex, is becoming ever more acute. To carry out the "field to counter" program we need a high-powered fleet of refrigerators on wheels. And the food program calls for delivering to the national economy sectors during the 10-year period tens of thousands of refrigerator motor vehicles and refrigerator railroad cars.

The capacities on hand in Minavtoprom make it possible for them to produce even today considerably more refrigerator motor vehicles. However, in Minavtoprom they say that at the same time the enterprises of Minkhimmash [Ministry of Chemical Machine-Building] are supposed to increase their production of refrigerator installations. But their problem is that Minelektrotekhprom [Ministry of Electrical Engineering] is not shipping enough motors; in addition, the chemistry people have not put the necessary thermal insulating materials into production. And on the whole, as is reported in Soyuzkompressormash [All-Union Association for Compressor Machine-Building], they do not as yet foresee any significant increase in the number of refrigerator units.

One of the variants for solving the problem has been suggested by V. Shavra, head of the refrigerator vehicle department of the ZIPP [All-Union Correspondence Institute of the Food Industry]: using transport cooled by liquefied gases, primarily nitrogen. It should be said that such work has been carried out in our country and we have even produced experimental batches of these vehicles in Yerevan--they were used to serve Olympiad-80. But the undertaking has not as yet advanced beyond the experimental batch. Moreover,

to fuel the motor vehicle refrigerators with nitrogen en route we need a network of stations: some department has to assume the responsibility for the establishment and operation of these stations. Incidentally, a number of European countries already have a very well-developed network of such stations.

Says P. Volkov, the deputy minister for the USSR fruit and vegetable industry: "The structure of the shipments requires that we have about 10,000 motor vehicle refrigerators at the end of the five-year plan. Today we have only 3,100 of them. And our requisitions for refrigerator transport are being satisfied in poor fashion. And after all, the industry has established 162 new specialized vegetable-growing sovkhozes, we have 8,000 stores, and the volume of shipments has reached 12.1 million tons a year. An efficient system for the shipments of fruits and vegetables on the "field to counter" pathway requires the establishment of a network of more than 20 specialized motor vehicle enterprises. But the refrigerator transport is being allocated not for growth of the transport fleet but for replacement of the vehicles written off.

To avoid large losses many farm organizations are compelled to send to the industrial centers fruits and vegetables which are in an unripe state. And showing up on the counters are green tomatoes and watermelons and withered peaches whereas in the motor vehicle refrigerator even red tomatoes keep very well up to 6 days, rose-colored ones 10 days, and brown ones even 15 days. Ripe peaches retain their freshness in refrigerated transport for 4 days. But to transport them, let us say, from Armenia, where there was a good crop this year, they would have to be unripe because delivery of 10,000 tons of ripe peaches to the central part of the country would require about 830 refrigerator vehicles.

The same problems face the cooperative organizations. This year of 818 refrigerated vehicles of all types requisitioned only 140 were allocated. And local shipments of perishable products were hampered by the fact that not one of the 20,000 mobile shops was equipped with refrigerator cabinets.

"Even if we had two refrigerators on wheels," said A. Sal'nikov, the director of the Rospotrebsoyus [Union of the Consumers' Societies of RSFSR] experimental canned goods plant, joining the conversation, "we would solve the raw materials problems in a jiffy. You do not use conventional transport to haul berries, plums and cranberries from a remote area. The refrigerator is another matter. It can be sent to other regions where the crop has turned out well.

But the problem is not just a matter of quantity. There are many flaws in the organization of the transport conveyer which lower the effectiveness of the use of the refrigerators on wheels. For example, Uzbekistan unloads a considerable quantity of vegetables, melon crops, fruits and grapes into a general fund; however, the places for loading these products is inadequately equipped with approach platforms with sheds and storehouses with artificial cooling. All this leads to spoilage of part of the output and a reduction of its market quality.

Practically no solution has as yet been found for the problem of repair of the refrigerators on wheels. There is a single repair plant in the system of Minavtotrans [Ministry of Motor Transport] RSFSR but it is geared for only 150 repair jobs a year and the need is for six times that many. The transport organization of the fruit and vegetable farming industry have set up their own repair shop at the motor vehicle base of the Krasnodar fruit and vegetable-growing industry. However, there is today a need for a centralized unified repair facility. Few spare parts are produced and the motor vehicle refrigerators are often idle because of the lack of batteries. The refrigerator on wheels is a complex assembly which is susceptible to outside influences and it requires careful maintenance and servicing. As it is, there are often instances of the cars being loaded for the return trip with boards, bricks and other materials. The motor vehicle people attribute this to the expensive refrigerator fleet and the attempt to increase its profitability. But would it not be better instead to increase the rates and the price of shipments by refrigerator transport, the objective in view being its ultimate effectiveness in the national economy, an effectiveness which, according to the IKTP [Institute of Complex Transportation Problems] of Gosplan USSR, comprises about 10 rubles for a ton of output. Would this not be better than using the refrigerators on wheels for purposes not in accord with the assignment?

Experience has demonstrated the superior effectiveness of these and not just in the delivery of delicate fruits to the northern cities but also for tomatoes, apples and early potatoes. This year the consolidated colonies of transport workers of the Kuban area, the Ukraine and Moldavia transported from Georgia 18,000 tons of early potatoes. By speeding up the deliveries they saved about 2,000 tons, which is equivalent to freeing 200 hectares of crops. It is economically advantageous to transport peaches, plums and cherries for a distance up to 2,000 kilometers. In western Europe, for example, a considerable proportion of the shipments is assigned to motor vehicle refrigerators: fruits from Greece and Italy are shipped to the Scandinavian countries. But for this they need motor vehicle refrigerators with a large freight capacity.

A substantial proportion of the shipments of vegetables and fruits is suitable for refrigerator trains, sections and "icebox" railroad cars. And how are they being used in the current harvest-time labor? We will say outright not in the best way. An alarming letter was sent to the editors by the members of the refrigerator brigades of the Moscow, Azberbaijan, Sverdlovsk, Privilzhsk, South Ural and Baltic railroads. In this letter they cite instances of layovers of refrigerator sections at a time when perishable goods are perishing in many regions. For example, hundreds of sections had early cabbages and early vegetables waiting in the southern republics since the middle of March and loading did not begin until the second half of May.

"The structure of the fleet of railroad refrigerators is not meeting our needs," says L. Dorokhin, deputy chief of the transport division of Mintorg [Ministry of Trade]. "It consists predominantly of group refrigerator trains which are not so easy to load in the remote areas and only a negligible proportion comprises autonomous refrigerator cars and individual isothermic

"cars. But they are quite maneuverable: they are loaded rapidly and they do not require the accumulation of a large volume of products. Single cars which have been hooked on to passenger trains deliver the products to the consumers considerably more rapidly than refrigerator trains, which most often travel at a low speed and with a multistop itinerary. But few of these single cars are produced and so for us the whole problem is sending, let us say, a car with yeast to a remote area.

According to the estimates of the specialists the refrigerator trains and sections in the overall fleet should not exceed 20 percent and the main reliance should be on the autonomous refrigerator cars and the "iceboxes." But today the relationship is still the opposite. No production of 20-ton refrigerator containers has been organized in the country and they also are needed. A flow line has been allocated for these purposes at the Altay railroad-car-building plant but it is not, of course, providing for the actual requirements. Consequently, both watermelons and central Asian melons have to be transported in bulk, even though they know beforehand that there will be large losses en route.

The effectiveness of the use of the refrigerator is significantly increased if provision is made for loading it only with good-quality, prechilled fruits and vegetables. This means there must be a developed network of covered warehouses, equipped stations for preliminary chilling, facilities at the wharves and mooring places, and railside tracks for the procurement bases. There is still a broken refrigerating chain in urban trade: providing the population with freshly frozen products requires vehicles with isothermic bodies of small freight capacity and vans for the delivery of school lunches to the rural schools and preschool institutions.

There is also need for up-to-date milk vans and other specialized vehicles. For example, the Minmyasomolprom [Ministry of Meat and Dairy Industry] requirements for milk tank cars are being satisfied at a 70 percent level. The enterprises of Minlegprishchemash [Ministry of Light and Food Industry Machinery] have been slow in developing production of large freight semitrailers with tank cars of 11,500 liters capacity. Because of this they have not been able to organize transport of returns and whey.

That is the situation with respect to refrigerated transport. As it is, today the volumes of the products produced by the rural economy enable us, as Comrade L. I. Brezhnev pointed out, to significantly improve the supplying of many types of foods to the population. Great losses are being prevented by the solution of this problem. Hence, in continuing to increase the production of vegetables and fruits we need to improve the transport, storage and processing of these products. Thus, the organization of production of all the types of refrigerated transport has become an important part of the food program. In reality we frequently simply fail to replace the motor vehicle refrigerator which can be transported directly in the field without unnecessary transshipments. There is also no need to accumulate a large quantity of fruits and the products retain their flavor for a long time. Organizing mass production of these products means the capability to fully provide the population of the country with the succulent and aromatic products of the gardens and fields.

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